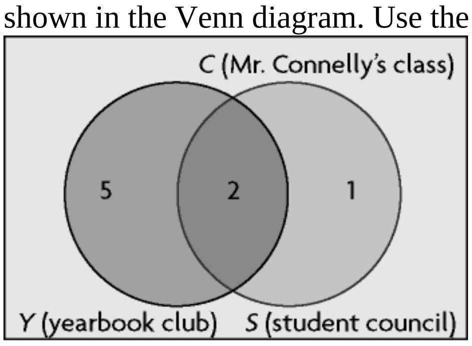
m 3201 practice review package

Multiple Choice Unit 1
Identify the choice that best completes the statement or answers the question.

____ **1.** Which pair of sets represents disjoint sets?

A. *N*, the set of natural numbers, and *I*, the set of integers
B. *T*, the set of all triangles, and *C*, the set of all circles
C. *N*, the set of natural numbers, and *P*, the set of positive integers
D. none of the above

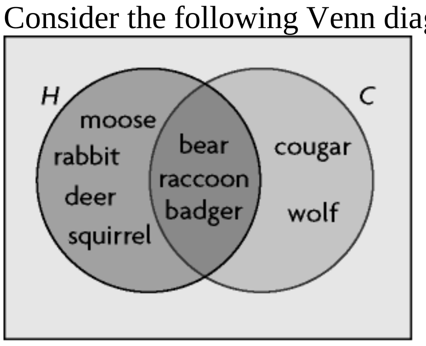
____ **2.** There are 28 students in Mr. Connelly's Grade 12 mathematics class. The number of students in the yearbook club and the number of students on student council are shown in the Venn diagram. Use the diagram to answer the following questions.



How many students are in both the yearbook club and on the student council?

A. 2
B. 5
C. 1
D. 7

____ **3.** Consider the following Venn diagram of herbivores and carnivores:



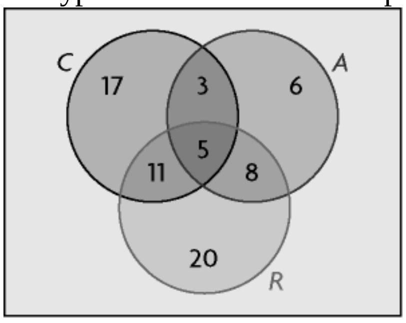
Determine $n(H \cap C)$.

A. 2
B. 9
C. 4
D. 3

____ **4.** Consider the following two sets:
• $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$
• $B = \{-9, -6, -3, 0, 3, 6, 9, 12\}$
Determine $A \cup B$.

A. $\{-9, -6, -3, 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12\}$
B. $\{0, 1, 2, -3, 4, 5, -6, 7, 8, -9, 10, 11, 12\}$
C. $\{1, 2, 4, 5, 7, 8, 10, 11\}$
D. $\{-9, -6, -3, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$

____ **5.** A summer camp offers canoeing, rock climbing, and archery. The following Venn diagram shows the types of activities the campers like.



Use the diagram to determine $n((R \cap A) \setminus C)$.

A. 14
B. 5
C. 26
D. 8

____ **6.** A combination lock opens with the correct three-digit code. Each wheel rotates through the digits 1 to 8. Suppose each digit can be used only once in a code. How many different codes are possible when repetition is not allowed?

A. 21
B. 63
C. 256
D. 336

____ **7.** The lunch special at a sandwich bar offers you a choice of 6 sandwiches, 4 salads, 6 drinks, and 3 desserts. How many different meals are possible if you choose one item from each category?

A. 432
B. 576
C. 646
D. 720

____ **8.** How many possible ways can you draw a single card from a standard deck and get either a heart or a club?

A. 2
B. 13
C. 14
D. 26

____ **9.** Evaluate.
$8! + 1!$

A. 40 321
B. 5041
C. 40 123
D. 16 777 217

____ **10.** Identify the expression that is equivalent to the following:
$n(n+1)(n-1)$

A. $\dfrac{(n+1)!}{(n-2)!}$
B. $\dfrac{(n+2)!}{(n-1)!}$
C. n^3
D. $(n+1)!$

____ **11.** Evaluate.
$_{21}P_2$

A. 441
B. 420
C. 399
D. 2 097 152

____ **12.** Solve for *n*.
$_{n-2}P_2 = 30$

A. $n = 5$
B. $n = 6$
C. $n = 7$
D. $n = 8$

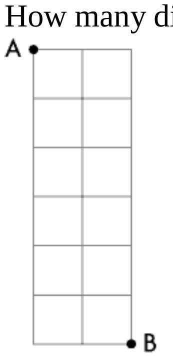
____ **13.** How many ways can 7 friends stand in a row for a photograph if Sheng always stands beside his girlfriend?

A. 1440
B. 5040
C. 360
D. 720

____ **14.** How many different arrangements can be made using all the letters in CANADA?

A. 120
B. 180
C. 360
D. 720

____ **15.** How many different routes are there from A to B, if you only travel south or east?



A. 16
B. 24
C. 28
D. 56

____ **16.** A fun fair requires 4 employees to work at the sack bar. There are 13 people available. How many ways can a group of 4 be chosen?

A. 1000
B. 715
C. 635
D. 808

____ **17.** Evaluate.
$_6C_2$

A. 15
B. 18
C. 30
D. 36

____ **18.** Solve for *n*.
$_nC_1 = 30$

A. $n = 6$
B. $n = 10$
C. $n = 30$
D. $n = 60$

____ **19.** From a standard deck of 52 cards, how many different five-card hands are there with at least four black cards?

A. 388 700
B. 649 740
C. 1 299 480
D. 454 480

____ **20.** The odds in favour of Macy passing her driver’s test on the first try are 7 : 4. Determine the odds against Macy passing her driver’s test on the first try.

A. 4 : 7
B. 4 : 11
C. 7 : 11
D. 3 : 11

____ **21.** The odds in favour of Macy passing her driver’s test on the first try are 7 : 4. Determine the probability that she will pass her driver’s test.

A. 0.226
B. 0.364
C. 0.571
D. 0.636

____ **22.** Julie draws a card at random from a standard deck of 52 playing cards. Determine the probability of the card being a diamond.

A. 0.250
B. 0.500
C. 0.625
D. 0.750

____ **23.** Nine boys and twelve girls have signed up for a trip. Only six students will be selected to go on the trip. Determine the number of ways in which there can be more girls than boys on the trip.

A. 17 456
B. 25 872
C. 29 778
D. 35 910

____ **24.** Four boys and three girls will be riding in a van. Only two people will be selected to sit at the front of the van. Determine the probability that only boys will be sitting at the front.

A. 28.57%
B. 33.45%
C. 39.06%
D. 46.91%

____ **25.** Two dice are rolled. Let *A* represent rolling a sum greater than 6. Let *B* represent rolling a sum that is a multiple of 4. Determine $P(A \cap B)$.

A. $\frac{1}{9}$
B. $\frac{1}{6}$
C. $\frac{1}{4}$
D. $\frac{7}{12}$

____ **26.** Select the events that are mutually exclusive.

A. Rolling a sum of 9 or rolling a multiple of 3 with a pair of six-sided dice, numbered 1 to 6.
B. Drawing a Jack or drawing a face card from a standard deck of 52 playing cards.
C. Walking to school or taking the bus to school.
D. Drawing a 2 or drawing a spade from a standard deck of 52 playing cards.

____ **27.** Hilary draws a card from a well-shuffled standard deck of 52 playing cards. Then she draws another card from the deck without replacing the first card. Determine the probability that both cards are hearts.

A. $\frac{1}{20}$
B. $\frac{1}{17}$
C. $\frac{1}{12}$
D. $\frac{1}{8}$

____ **28.** Identify the rational expression that is equivalent to $\frac{2-x}{3x}$.

A. $\frac{4-2x}{3x}$
B. $\frac{4-2x}{6x}$
C. $\frac{2-2x}{6x}$
D. $6x-3x^2$

____ **29.** Determine the non-permissible value(s) for $\frac{3x+2x^2}{x^2-6x}$.

A. $x \neq 0, x \neq \frac{1}{6}$
B. $x \neq 0, x \neq 6$
C. $x \neq 6$
D. $x \neq 0, x \neq -6$

____ **30.** Which rational expression is simplified?

i) $\frac{x^2+3x}{4x^3}$ **ii)** $\frac{15x^3+6}{3x+9}$ **iii)** $\frac{3x+6}{20x}$

A. i) and iii)
B. ii)
C. iii)
D. i) and ii)

____ **31.** Simplify $\dfrac{16h^2 - 40h}{24h^3}$.

A. $\dfrac{h-5}{3h^2}$, $h \neq 0$
B. $\dfrac{2h-5}{3h^2}$, $h \neq 0$
C. $\dfrac{2h-10}{6h^2}$, $h \neq 0$
D. $\dfrac{2h-5}{3h}$, $h \neq 0$

____ **32.** Simplify $\dfrac{6d+3}{3d} \div \dfrac{2d+1}{4}$.

A. $\dfrac{1}{2d}$, $d \neq 0, -\dfrac{1}{2}$
B. $\dfrac{4}{3d}$, $d \neq 0, -\dfrac{1}{2}$
C. $\dfrac{3}{d+1}$, $d \neq 0, -\dfrac{1}{2}$
D. $\dfrac{4}{d}$, $d \neq 0, -\dfrac{1}{2}$

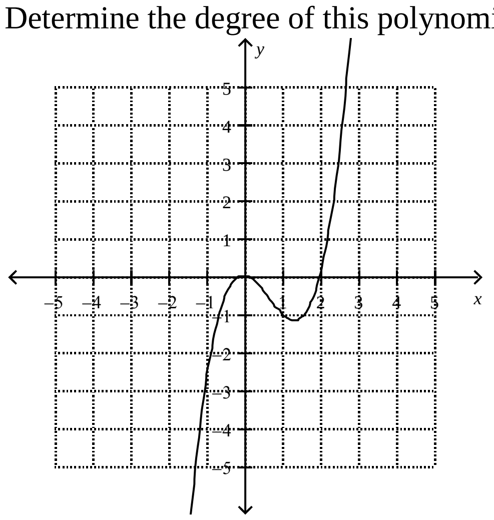
____ **33.** Determine all the non-permissible values of the variable.
$\dfrac{4}{k+2} \div \dfrac{8k}{k-3}$

A. $k \neq -2, 0, 3$
B. $k \neq 0, 2, 3$
C. $k \neq -2, 3$
D. $k \neq 0, 3$

____ **34.** Simplify $\dfrac{1}{q-2} + \dfrac{q}{2(q+3)}$.

A. $\dfrac{6+4q+q^2}{2(q-2)(q+3)}$, $q \neq 2, -3$
B. $\dfrac{6+q^2}{2(q-2)(q+3)}$, $q \neq 2, -3$
C. $\dfrac{6-4q+q^2}{2(q-2)(q+3)}$, $q \neq 2, -3$
D. $\dfrac{6-4q}{2(q-2)(q+3)}$, $q \neq 2, -3$

____ **35.** Determine the degree of this polynomial function:

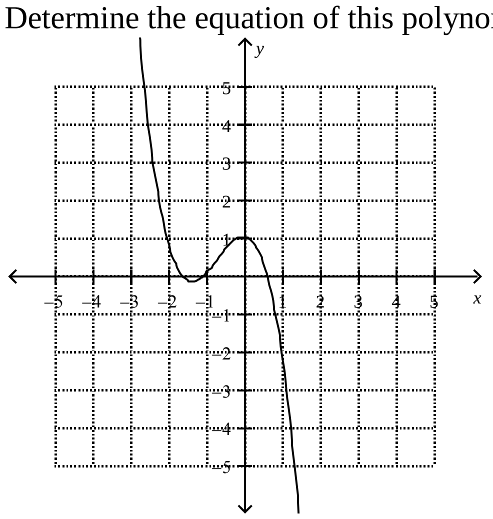


A. 0
B. 1
C. 2
D. 3

____ **36.** Determine the leading coefficient of this polynomial function:
$f(x) = \frac{1}{2}x^3 + 6x - 8$

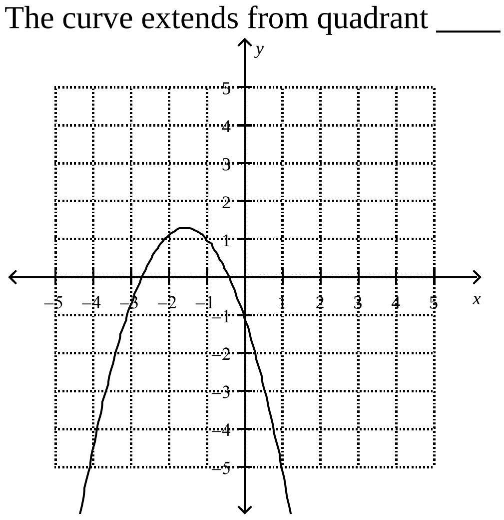
A. $\frac{1}{2}$
B. 6
C. –8
D. 0

____ **37.** Determine the equation of this polynomial function:



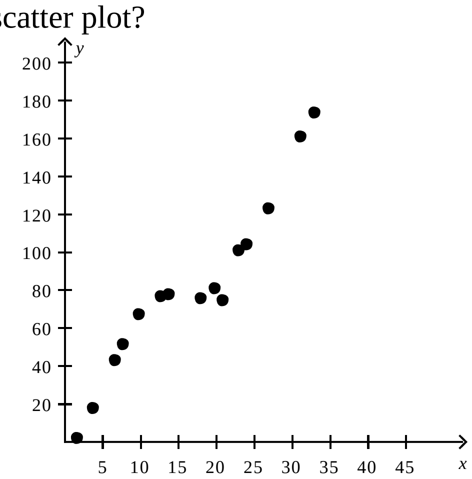
A. $f(x) = -x^2 - 3x - 1$
B. $g(x) = x^2 - 2x + 1$
C. $h(x) = -x^3 - 2x^2 + 1$
D. $j(x) = x^3 + 2x$

____ **38.** Fill in the blanks to describe the end behaviour of this polynomial function:
The curve extends from quadrant ____ to quadrant ____.



A. II; I
B. II; IV
C. III; I
D. III; IV

____ **39.** What kind of relationship might there be between the independent and dependent variables in this scatter plot?



A. linear
B. quadratic
C. cubic
D. none of the above

____ **40.** The average retail price of gas in Canada from 1979 to 2008 can be modelled by the function
$P(y) = 0.008y^3 – 0.307y^2 + 4.830y + 25.720$
where P is the price of gas in cents per litre and y is the number of years after 1979.
Determine the average price of gas in 2002.

A. 68.8¢/L
B. 69.8¢/L
C. 70.4¢/L
D. 71.7¢/L

____ **41.** Determine the equation of the cubic regression function for the data.

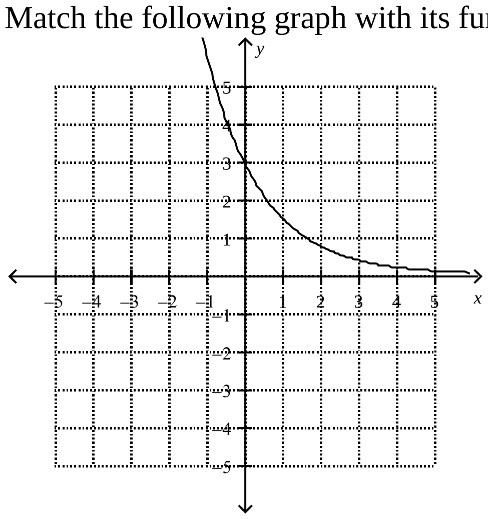
x	2	4	7	10	12	13	17	19
y	135	120	105	102	99	88	78	47

A. $y = 0.05x^3 – 1.5x^2 – 16x + 162.5$
B. $y = –0.05x^3 + 1.5x^2 – 16x + 162.5$
C. $y = 0.05x^3 + 1.5x^2 + 16x – 162.5$
D. $y = –0.05x^3 + 1.5x^2 + 16x – 162.5$

____ **42.** Which of the following is an exponential function?

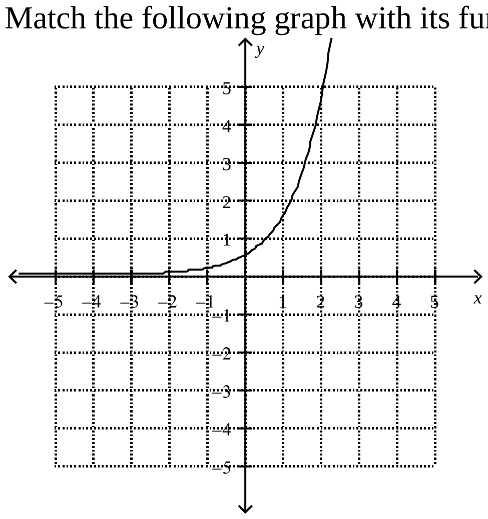
A. $f(x) = \pi(1)^x$
B. $g(x) = 3(-7)^x$
C. $h(x) = 4(\pi)^x$
D. $j(x) = x(2)^x$

____ **43.** Match the following graph with its function.



A. $y = 3(0.5)^x$
B. $y = 2(1.25)^x$
C. $y = 0.5(3)^x$
D. $y = 2(0.75)^x$

____ **44.** Match the following graph with its function.



A. $y = 3(0.5)^x$
B. $y = 2(1.25)^x$
C. $y = 0.5(3)^x$
D. $y = 2(0.75)^x$

____ **45.** Determine the y-intercept of the exponential function $f(x) = 4\left(\frac{1}{2}\right)^x$.

A. 0
B. 1
C. 2
D. 4

____ **46.** Which option best describes the behaviour of the exponential function $f(x) = 4\left(\frac{1}{2}\right)^x$?

A. increasing because $a > 1$
B. decreasing because $0 < a < 1$
C. increasing because $b > 1$
D. decreasing because $0 < b < 1$

____ **47.** Express $\left(\frac{1}{27}\right)^{x+1}$ as a power with a base of 3.

A. 3^{3x-3}
B. 3^{-3x-3}
C. 3^{-3x+3}
D. 3^{3x+3}

____ **48.** Solve the following exponential equation by writing both sides with the same base.
$2^{3-z} = \frac{1}{32}$

A. $z = 7$
B. $z = 8$
C. $z = 9$
D. $z = 10$

____ **49.** Solve the following exponential equation by writing both sides with the same base.
$5(4)^{z+2} = 5120$

A. $z = 0$
B. $z = 1$
C. $z = 2$
D. $z = 3$

____ **50.** Solve the following exponential equation by writing both sides with the same base.
$3^{4a} = \sqrt{243}$

A. $a = \frac{3}{4}$
B. $a = \frac{5}{8}$
C. $a = \frac{9}{16}$
D. $a = \frac{7}{8}$

____ **51.** The population of a specific bacteria growing in a Petri dish is modelled by the function
$P(t) = 5000(2)^{\frac{t}{3}}$
where $P(t)$ represents the number of bacteria and t represents the time, in days, after the initial time.
Determine the time when the population is 40 000.

A. 3 days
B. 6 days
C. 9 days
D. 24 days

____ **52.** Determine the equation of the exponential regression function for the data.

x	0	1	2	3	4	5
y	3.5	5.6	9.0	14.2	23.1	36.7

A. $y = 3.5(1.6)^x$
B. $y = 2.2(1.6)^x$
C. $y = 3.5(1.8)^x$
D. $y = 3.5(0.8)^x$

____ **53.** The equation of the exponential function that models a data set is
$y = 6.8(1.03)^x$
Determine the range of this function.

A. $\{y \mid y > 0, y \in \mathrm{R}\}$
B. $\{y \mid y \in \mathrm{R}\}$
C. $\{y \mid y > 6.8, y \in \mathrm{R}\}$
D. $\{y \mid y > 1.03, y \in \mathrm{R}\}$

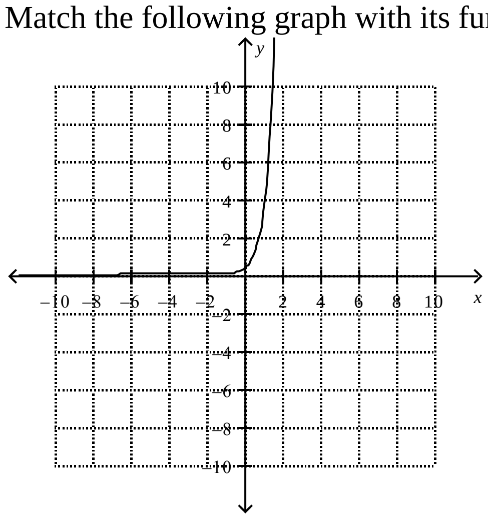
____ **54.** An investment can be modelled by the following growth function, where x represents the time in years:
$y = 2500(1.018)^x$
How long, in months, did it take for the account to reach $3000?

A. 10
B. 123
C. 28
D. 94

____ **55.** Indira invested $1500 at 2%/a compounded semi-annually.
Define an exponential growth function for this investment in the form
$A(n) = P(1 + i)^n$
where n represents the number of compounding periods.

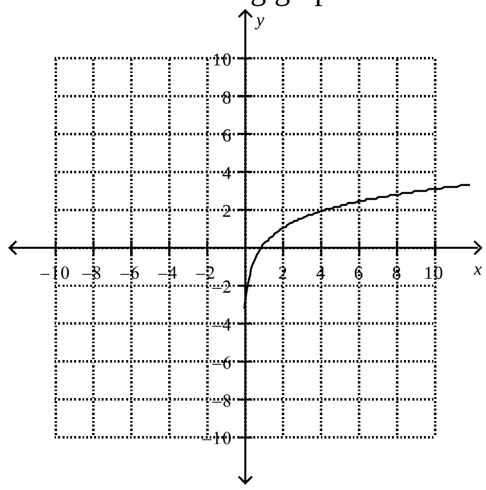
A. $A(n) = 1500(1.01)^n$
B. $A(n) = 1500(1.04)^n$
C. $A(n) = 2500(1.02)^n$
D. $A(n) = 2500(1.002)^n$

____ **56.** Match the following graph with its function.



A. $y = -\frac{1}{3}\ln x$
B. $y = 3\log x$
C. $y = -\frac{1}{3}(3)^x$
D. $y = 0.3(10)^x$

____ **57.** Match the following graph with its function.



A. $y = -\frac{1}{3}\ln x$
B. $y = 3\log x$
C. $y = -\frac{1}{3}(3)^x$
D. $y = 0.3(10)^x$

____ **58.** Which logarithmic equation correctly represents the exponential equation $10^7 = x$?

A. $x = \log 7$
B. $x = \log 10$
C. $7 = \log x$
D. $10 = \log x$

____ **59.** Evaluate the logarithmic expression $\log_5 15\,625$.

A. 6
B. 7
C. 8
D. 9

____ **60.** Evaluate the logarithmic expression $\log_{16} 4$.

A. 0
B. 0.5
C. 1
D. 2

____ **61.** Calculate the pH of a solution with a hydrogen ion concentration of 6.5×10^{-6} mol/L.
Recall that pH, $p(x)$, is defined by the equation
$p(x) = -\log x$
where the concentration of hydrogen ions, x, in a solution is measured in moles per litre.

A. 6.5
B. –5.2
C. –6.5
D. 5.2

____ **62.** Determine the concentration of hydrogen ions in bleach, with a pH of 12.8.
Recall that pH, $p(x)$, is defined by the equation
$p(x) = -\log x$
where the concentration of hydrogen ions, x, in a solution is measured in moles per litre.

A. 1.3×10^{-13} mol/L
B. 1.6×10^{-13} mol/L
C. 1.3×10^{-12} mol/L
D. 1.6×10^{-12} mol/L

____ **63.** How many times greater is the intensity of 80 dB sound than the intensity of 40 dB sound?
Recall that sound level, β, in decibels, is defined by the equation
$\beta = 10(\log I + 12)$
where I is the sound intensity in watts per square metre.

A. 2
B. 40
C. 10 000
D. 100 000

____ **64.** What is the sound level of a noise ten times as intense as a conversation at 68 dB?
Recall that sound level, β, in decibels, is defined by the equation
$\beta = 10(\log I + 12)$
where I is the sound intensity in watts per square metre.

A. 680 dB
B. 58 dB
C. 69 dB
D. 78 dB

____ **65.** Which expression is equivalent to log 88?

A. log 80 + log 8
B. log 22 + log 4
C. log 11 + log 2
D. log 100 – log 12

____ **66.** Which expression is equivalent to log 64?

A. 2 log 4
B. 2 log 8
C. 4 log 2
D. 8 log 2

____ **67.** Evaluate:
$\log_{12} 16 + 2\log_{12} 3$

A. –4
B. 4
C. 2
D. 0

____ **68.** Which value is the best estimate for $\log_3 100$?

A. 4.2
B. 4.7
C. 5.2
D. 5.7

____ **69.** Solve the following equation to three decimal places.
$1000 = 2000(0.93)^n$

A. $n = 0.105$
B. $n = 0.631$
C. $n = 7.018$
D. $n = 9.551$

____ **70.** The fish population in Loon Lake is modelled by the equation
$P(t) = 2500(0.92)^t$
where $P(t)$ represents the number of fish and t represents the time, in years, since January 2010. In which year will the fish population decrease to 1500?

A. 2013
B. 2014
C. 2015
D. 2016

____ **71.** Determine the equation of the logarithmic regression function for the data.

x	1	2	3	4	5	6
y	0.0	3.2	4.5	5.0	5.4	5.6

A. $y = 1.55 + 4.25 \ln x$
B. $y = 0.54 + 3.11 \ln x$
C. $y = 2.74 + 1.31 \ln x$
D. $y = -0.81 + 2.45 \ln x$

____ **72.** Choose the best estimate for 120° in radians.

A. 2.1
B. 0.7
C. 2.8
D. 3.1

____ **73.** Choose the best estimate for 0.8 radians in degrees.

A. 8°
B. 15°
C. 30°
D. 45°

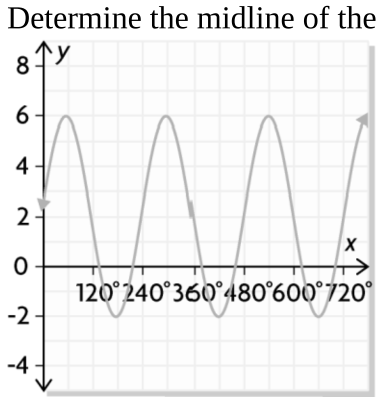
____ **74.** Which of the following is not an x-intercept of the graph of $y = \cos x$?

A. 90°
B. –90°
C. 180°
D. 270°

____ **75.** Which of the following is **not** a periodic function?

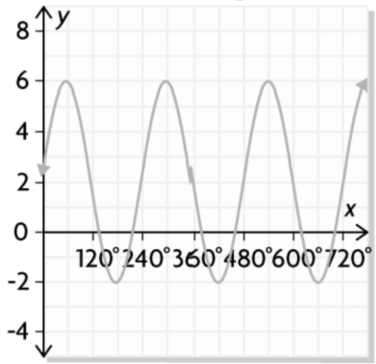
A. $y = \cos x$
B. $y = x$
C. $y = -\sin x$
D. $y = -2 \cos x$

____ **76.** Determine the midline of the following graph.



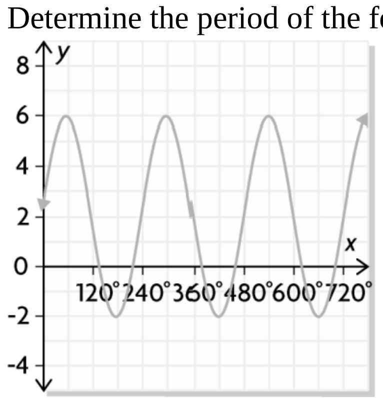
A. $y = 2$
B. $y = 3$
C. $y = 4$
D. $y = 5$

____ **77.** Determine the amplitude of the following graph.



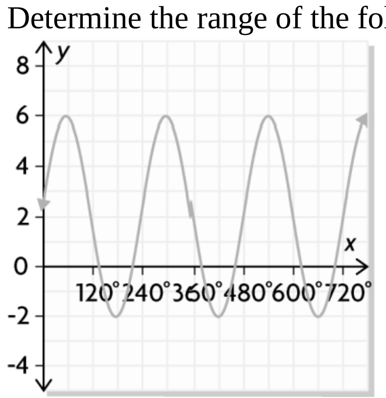
A. 2
B. 3
C. 4
D. 5

____ **78.** Determine the period of the following graph.



A. 120°
B. 240°
C. 300°
D. 360°

____ **79.** Determine the range of the following graph.



A. $\{y \mid 0 \leq y \leq 8, y \in \mathrm{R}\}$
B. $\{y \mid -2 \leq y \leq 6, y \in \mathrm{R}\}$
C. $\{y \mid -4 \leq y \leq 8, y \in \mathrm{R}\}$
D. $\{y \mid y \in \mathrm{R}\}$

____ **80.** A sinusoidal graph has an amplitude of 10 and a maximum at the point (18, 5). Determine the midline of the graph.

A. $y = 0$
B. $y = -5$
C. $y = 13$
D. $y = 8$

____ **81.** Select the function with the greatest amplitude.

A. $y = 2 \sin 3(x + 90°) + 5$
B. $y = 3 \sin 2(x - 90°) - 3$
C. $y = \frac{1}{3} \sin (x + 90°) - 1$
D. $y = \sin 0.5(x - 90°)$

____ **82.** Select the function with the greatest period.

A. $y = 2 \sin 3(x + 90°) + 5$
B. $y = 3 \sin 2(x - 90°) - 3$
C. $y = \frac{1}{3} \sin (x + 90°) - 1$
D. $y = \sin 0.5(x - 90°)$

____ **83.** Select the function with the greatest maximum value.

A. $y = 2 \sin 3(x + 90°) + 5$
B. $y = 3 \sin 2(x - 90°) - 3$
C. $y = \frac{1}{3} \sin (x + 90°) - 1$
D. $y = \sin 0.5(x - 90°)$

____ **84.** Determine the amplitude of the following function.
$y = 3 \sin 2(x + 90°) - 1$

A. 2
B. 3
C. 4
D. 5

____ **85.** Determine the period of the following function.
$y = 3 \sin 2(x + 90°) - 1$

A. 180°
B. 360°
C. 720°
D. 1080°

____ **86.** Determine the midline of the following function.
$y = 3 \sin 2(x + 90°) - 1$

A. $y = 2$
B. $y = 3$
C. $y = 0$
D. $y = -1$

____ **87.** The following data set is sinusoidal. Determine the missing value from the table.

x	0	1	2	3	4	5	6
y	1.0	2.5	4.0	2.5	1.0	2.5	

A. –0.5
B. 1.0
C. 2.5
D. 4.0

____ **88.** The height of a mass attached to a spring can be modelled by the sinusoidal function
$h(t) = 84 - 6.7 \cos 24.8t$
where $h(t)$ represents the height in centimetres and t represents the time in seconds. What is the height of the mass after 10 s?

A. 77.4 cm
B. 84.0 cm
C. 86.9 cm
D. 90.6 cm

89.The interest rate on a loan shown in the chart below is 5% compounded monthly. How much of the third payment is interest toward the loan?

Payment Period (month)	Payment ($)	Principal Paid ($)	Balance ($)
0			15,000
1	450	387.50	14,612.50
2	450	389.11	14,223.39
3	450	390.74	13,832.65

90. 182 biweekly payments are required to pay off a loan. How many years does this represent? How many monthly payment would this actually be?

91. $A = 3000(1.06)^4$ represnts a bank loan that is compounded annually. What is the yearly interest rate? What if the question said it was compounded semi-annually...how would the answeer change?

92. Which represenst the highest interest that would be paid?

	Interest rate	Compounded
(A)	12%	daily
(B)	12%	monthly
(C)	19%	daily
(D)	19%	monthly

93. A student repaid a total of $6381.41 for a loan including the prinicpal and interest. If the interest rate was 10% compounded semi-annually for 4 years, what was the principal amount of the loan, to the nearest dollar?

Part II

51

In a survey of 55 people, the following results were recorded:

13 people like Hawaiian pizza
19 people like pepperoni pizza
26 people like cheese pizza
15 people do not like pizza
5 people like Hawaiian pizza and pepperoni pizza, but not cheese pizza
2 people likes all types of pizza
2 people like Hawaiian pizza and cheese pizza, but not pepperoni pizza

Set up a Venn diagram and use it to determine how many studenst like only cheese pizza.

52 a In how many ways how many ways can you sit 5 girls and 3 boys in a row if you cannot have the boys sitting together.

52 b Algebraically solve: $A)\ \frac{n!}{(n-2)!}=182 \quad B)\ {}_nP_2=42 \quad C)\ {}_{n+1}C_1=20$

52 c Three students are to be chosen from a group of 16 students to fill position on a committee for President, vice-president and secretary. In how many ways can this be accomplished?

52 c There are 5 boys and 6 girls to select a committee that must contain 5 people. How many ways can this be accomplished if there must be at least 3 girls on the committee?

53 a A five digit number is to be generated from the digits 3,4,5,6,7. What is the probability that a number chosen at random will be even?

53 b A person will be randomly selected from a group to draw a marble from a bag. The odds of selecting a female from the group is 9:10 and the odds of drawing a red marble from the bag are 1:4. What is the probability of a non-red marble being drawn from the bag by a male from the group?

54 Simplify and state the restrictions:

$$A)\ \frac{9-x^2}{9-9x}\div\frac{4x+4}{8(x-3)} \quad B)\ \frac{2x+3}{3x-3}-\frac{5x+3}{3x^2-3x} \quad C)\ \frac{1-x^2}{x^2+x}+\frac{6}{x+1}$$

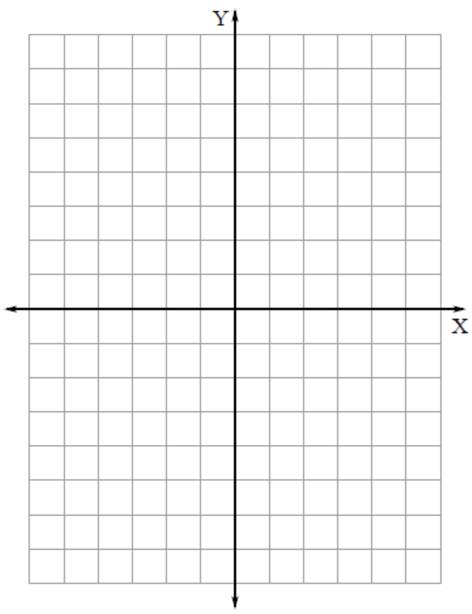
54 b Pat and Alex can paint a house in 8 hours if they work together. Pat is a professional painter and can paint twice as fast as Alex. How long would it take Pat to paint the house by himself?

54 c It take Joseph 9 hours to mow a large filed while it take Alex 7.5 hours. How long would it take them to mow the lawn if they work together?

54b Solve for x: state the non-permissible roots first!

$$A)\ \frac{2x^2+1}{x+3}=\frac{x}{4}+\frac{5}{x+3} \quad B)\ \frac{2x+3}{x+5}+\frac{1}{2}=\frac{-14}{2(x+5)}$$

55 a Sketch two possible graphs that are different, yet both are cubic functions with a positive leading coefficient and a negative leading coefficient and as well as negative y-intercepts. Explain the end behavior of both your graphs.



55 b Given the function $f(x) = -2x^3 + 5x^2 - 3x - 4$ state:

i) The y-interecpt ii) the end behaviour iii) Max # of possible x-intercepts
iv) Why is the function not a straight line or a parabola?

56 a Solve for x: $A)\ \sqrt{243} = 9^{-2x+1}$ $B)\ \left(\frac{1}{64}\right)^{6-2x} = 4^{x+1}$

56 b Helen is to invest $6000. Determine the amount of money she will have at the end of the investment period that:

i) Pays 5% semi-annually for 4 years
ii) Pays 6% compounded monthly for 3 years
iii) Pays 4% compounded dailly for 2.5 years

57 a Alegrbaically solve $A)\ 6^{2x+1} = 9^{x-1}$ $B)\ 4^{x-1} - 9^{x+1} = 0$ $C)\ 3^{8x+1} = 2^{x-1}$

57 b The pH scale is used to measure acidity of a sloution. The pH can be represnted by y = -log x where x is the hydrogen ion concentration and y is the pH of the solution. Black coffee has an acidity of 5.2 while choculate milk has an acidity of 7.2. Determine the hydrogen ion concentration of each liquid and determine how many more times black coffee is acidic than choculate milk in this case.

57 c The magnitude of an earthquake can be dtermined using the function y = log x where x is the amplitude of vibrations measured on a seismograph.

Location and Date	Magnitude
Chernobyl, 1987	4
Haiti, January 12, 2012	7
Northern Italy, May 20, 2012	6

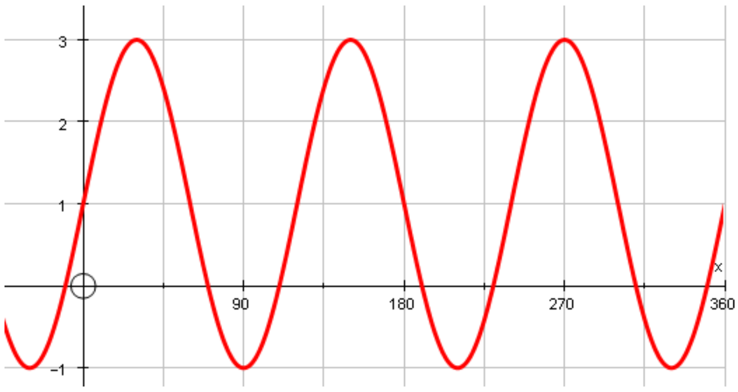
(i) How many times as intense was the earthquake in Haiti compared to the one in Chernobyl?

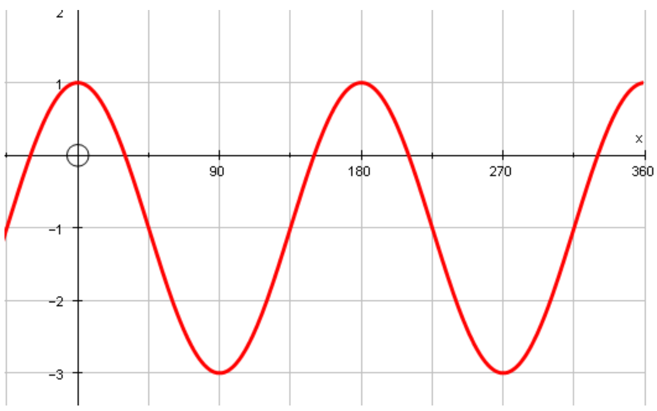
(ii) How many times as intense was the earthquake in Haiti compared to the one in Northern Italy?

(iii) How many times as intense was the earthquake in Northern Italy compared to the one in Chernobyl?

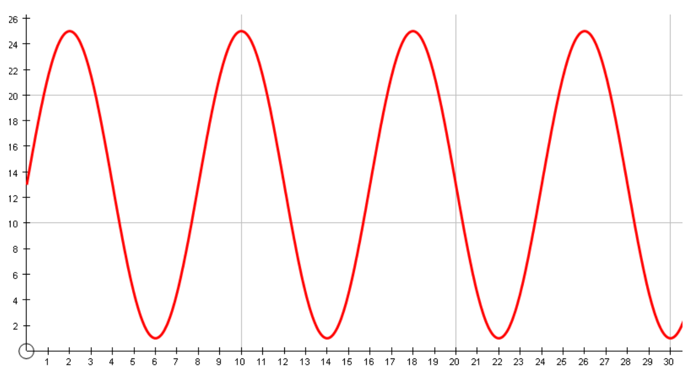
(iv) If a recent earthquake was half as intense as the one in Haiti what would be the approximate magnitude?

58 For each graph below determine the amplitude, period, equation of the midline, domian and range. Also write an equation for the graph in the form of y = asinb(x-c)+d and y = acosb(x-c)+d.





59 The graph below represents the path of a Ferris wheel as it rotates over time where x is time in seconds and y represents the height meters of a car you are sitting in as it rotates around.



Determine the following and what they each mean in relation to the wheel: the amplitude, the equation of the midline, the period, the maximum and minimum heights of the wheel, why there are no x-intercepts, and at what height did you board the wheel.

60 Elise borrowed $4500 at a rate of 8% according to below. Determine the total cost of borrowing in each case.

A) 9% compounded monthly for 4 years
B) 8% compounded semi-annually for 5 years

61 A 25 year mortgage of $300,000 at 6.5% compounded monthly has a monthly payment$2025.62.
A) Determine the total amount you will have to pay back and how much you were charged for the mortgage.
B) How much of the first payment was actual interest?

m 3201 practice exam
Answer Section

MULTIPLE CHOICE

1. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 1.1
OBJ: 2.1 Provide examples of the empty set, disjoint sets, subsets and universal sets in context, and explain the reasoning. | 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.4 Determine the elements in the complement, the intersection or the union of two sets. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation.
TOP: Types of Sets and Set Notation KEY: set | element | disjoint

2. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 1.2
OBJ: 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation.
TOP: Exploring Relationships between Sets KEY: set | element

3. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 1.3
OBJ: 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.4 Determine the elements in the complement, the intersection or the union of two sets. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Intersection and Union of Two Sets
KEY: set | element | intersection

4. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 1.3
OBJ: 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. | 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. | 2.4 Determine the elements in the complement, the intersection or the union of two sets. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Intersection and Union of Two Sets
KEY: set | element | union

5. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 1.4
OBJ: 2.5 Explain how set theory is used in applications such as Internet searches, database queries, data analysis, games and puzzles. | 2.6 Identify and correct errors in a given solution to a problem that involves sets. | 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation. TOP: Applications of Set Theory
KEY: set | element | intersection

6. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 2.1
OBJ: 4.1 Represent and solve counting problems, using a graphic organizer. | 4.2 Generalize the fundamental counting principle, using inductive reasoning. | 4.3 Identify and explain assumptions

made in solving a counting problem. | 4.4 Solve a contextual counting problem, using the fundamental counting principle, and explain the reasoning. TOP: Counting Principles
KEY: counting | Fundamental Counting Principle

7. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 2.1
OBJ: 4.1 Represent and solve counting problems, using a graphic organizer. | 4.2 Generalize the fundamental counting principle, using inductive reasoning. | 4.3 Identify and explain assumptions made in solving a counting problem. | 4.4 Solve a contextual counting problem, using the fundamental counting principle, and explain the reasoning. TOP: Counting Principles
KEY: counting | Fundamental Counting Principle

8. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 2.1
OBJ: 4.1 Represent and solve counting problems, using a graphic organizer. | 4.2 Generalize the fundamental counting principle, using inductive reasoning. | 4.3 Identify and explain assumptions made in solving a counting problem. | 4.4 Solve a contextual counting problem, using the fundamental counting principle, and explain the reasoning. TOP: Counting Principles
KEY: counting

9. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 2.2
OBJ: 5.1 Represent the number of arrangements of n elements taken n at a time, using factorial notation. | 5.2 Determine, with or without technology, the value of a factorial. | 5.3 Simplify a numeric or algebraic fraction containing factorials in both the numerator and denominator. | 5.4 Solve an equation that involves factorials.
TOP: Introducing Permutations and Factorial Notation
KEY: permutation | factorial notation

10. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 2.2
OBJ: 5.1 Represent the number of arrangements of n elements taken n at a time, using factorial notation. | 5.2 Determine, with or without technology, the value of a factorial. | 5.3 Simplify a numeric or algebraic fraction containing factorials in both the numerator and denominator. | 5.4 Solve an equation that involves factorials.
TOP: Introducing Permutations and Factorial Notation
KEY: permutation | factorial notation

11. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 2.3
OBJ: 5.1 Represent the number of arrangements of n elements taken n at a time, using factorial notation. | 5.5 Determine the number of permutations of n elements taken r at a time. | 5.8 Generalize strategies for determining the number of permutations of n elements taken r at a time.
TOP: Permutations When All Objects Are Distinguishable KEY: permutation

12. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 2.3
OBJ: 5.1 Represent the number of arrangements of n elements taken n at a time, using factorial notation. | 5.5 Determine the number of permutations of n elements taken r at a time. | 5.8 Generalize strategies for determining the number of permutations of n elements taken r at a time.
TOP: Permutations When All Objects Are Distinguishable KEY: permutation

13. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 2.3
OBJ: 5.1 Represent the number of arrangements of n elements taken n at a time, using factorial notation. | 5.5 Determine the number of permutations of n elements taken r at a time. | 5.8 Generalize strategies for determining the number of permutations of n elements taken r at a time.
TOP: Permutations When All Objects Are Distinguishable KEY: permutation

14. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 2.4
OBJ: 5.6 Determine the number of permutations of n elements taken n at a time where some

elements are not distinct. | 5.7 Explain, using examples, the effect on the total number of permutations of n elements when two or more elements are identical.
TOP: Permutations When Objects Are Identical
KEY: permutation | factorial notation

15. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 2.4
OBJ: 5.6 Determine the number of permutations of n elements taken n at a time where some elements are not distinct. | 5.7 Explain, using examples, the effect on the total number of permutations of n elements when two or more elements are identical.
TOP: Permutations When Objects Are Identical
KEY: permutation | factorial notation

16. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 2.5
OBJ: 4.3 Identify and explain assumptions made in solving a counting problem. | 5.1 Represent the number of arrangements of n elements taken n at a time, using factorial notation.
TOP: Exploring Combinations KEY: counting | combination | factorial notation

17. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 2.6
OBJ: 6.1 Explain, using examples, why order is or is not important when solving problems that involve permutations or combinations. | 6.2 Determine the number of combinations of n elements taken r at a time. | 6.3 Generalize strategies for determining the number of combinations of n elements taken r at a time. TOP: Combinations
KEY: counting | combination

18. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 2.6
OBJ: 6.1 Explain, using examples, why order is or is not important when solving problems that involve permutations or combinations. | 6.2 Determine the number of combinations of n elements taken r at a time. | 6.3 Generalize strategies for determining the number of combinations of n elements taken r at a time. TOP: Combinations
KEY: counting | combination

19. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 2.7
OBJ: 4.3 Identify and explain assumptions made in solving a counting problem. | 4.4 Solve a contextual counting problem, using the fundamental counting principle, and explain the reasoning. | 5.5 Determine the number of permutations of n elements taken r at a time. | 6.2 Determine the number of combinations of n elements taken r at a time.
TOP: Solving Counting Problems
KEY: counting | combination | Fundamental Counting Principle

20. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 3.2
OBJ: 1.1 Provide examples of statements of probability and odds found in fields such as media, biology, sports, medicine, sociology and psychology. | 1.2 Explain, using examples, the relationship between odds (part-part) and probability (part-whole). | 1.3 Express odds as a probability and vice versa. | 1.4 Determine the probability of, or the odds for and against, an outcome in a situation. | 1.5 Explain, using examples, how decisions may be based on probability or odds and on subjective judgments. | 1.6 Solve a contextual problem that involves odds or probability. TOP: Probability and Odds
KEY: probability | odds in favour | odds against

21. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 3.2
OBJ: 1.1 Provide examples of statements of probability and odds found in fields such as media, biology, sports, medicine, sociology and psychology. | 1.2 Explain, using examples, the relationship between odds (part-part) and probability (part-whole). | 1.3 Express odds as a

probability and vice versa. | 1.4 Determine the probability of, or the odds for and against, an outcome in a situation. | 1.5 Explain, using examples, how decisions may be based on probability or odds and on subjective judgments. | 1.6 Solve a contextual problem that involves odds or probability. TOP: Probability and Odds
KEY: probability | odds in favour

22. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 3.2
OBJ: 1.1 Provide examples of statements of probability and odds found in fields such as media, biology, sports, medicine, sociology and psychology. | 1.2 Explain, using examples, the relationship between odds (part-part) and probability (part-whole). | 1.3 Express odds as a probability and vice versa. | 1.4 Determine the probability of, or the odds for and against, an outcome in a situation. | 1.5 Explain, using examples, how decisions may be based on probability or odds and on subjective judgments. | 1.6 Solve a contextual problem that involves odds or probability. TOP: Probability and Odds
KEY: probability | odds in favour

23. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 3.3
OBJ: 5.9 Solve a contextual problem that involves probability and permutations. | 6.4 Solve a contextual problem that involves combinations and probability.
TOP: Probabilities Using Counting Methods KEY: probability | permutation

24. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 3.3
OBJ: 5.9 Solve a contextual problem that involves probability and permutations. | 6.4 Solve a contextual problem that involves combinations and probability.
TOP: Probabilities Using Counting Methods KEY: probability | permutation

25. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 3.4
OBJ: 2.1 Classify events as mutually exclusive or non-mutually exclusive, and explain the reasoning. | 2.2 Determine if two events are complementary, and explain the reasoning. | 2.3 Represent, using set notation or graphic organizers, mutually exclusive (including complementary) and non-mutually exclusive events. | 2.4 Solve a contextual problem that involves the probability of mutually exclusive or non-mutually exclusive events. | 2.5 Solve a contextual problem that involves the probability of complementary events. | 2.6 Create and solve a problem that involves mutually exclusive or non-mutually exclusive events.
TOP: Mutually Exclusive Events KEY: probability | mutually exclusive

26. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 3.4
OBJ: 2.1 Classify events as mutually exclusive or non-mutually exclusive, and explain the reasoning. | 2.2 Determine if two events are complementary, and explain the reasoning. | 2.3 Represent, using set notation or graphic organizers, mutually exclusive (including complementary) and non-mutually exclusive events. | 2.4 Solve a contextual problem that involves the probability of mutually exclusive or non-mutually exclusive events. | 2.5 Solve a contextual problem that involves the probability of complementary events. | 2.6 Create and solve a problem that involves mutually exclusive or non-mutually exclusive events.
TOP: Mutually Exclusive Events KEY: probability | mutually exclusive

27. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 3.5
OBJ: 3.2 Determine the probability of an event, given the occurrence of a previous event. | 1.6 Solve a contextual problem that involves odds or probability. TOP: Conditional Probability
KEY: probability | conditional probability

28. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 4.1
OBJ: 1.1 Compare the strategies for writing equivalent forms of rational expressions to writing

equivalent forms of rational numbers. | 1.2 Explain why a given value is non-permissible for a given rational expression. | 1.3 Determine the non-permissible values for a rational expression. | 1.4 Determine a rational expression that is equivalent to a given rational expression by multiplying the numerator and denominator by the same factor (limited to a monomial or a binomial), and state the non-permissible values of the equivalent rational expression.
TOP: Equivalent Rational Expressions KEY: rational expression

29. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 4.1
OBJ: 1.1 Compare the strategies for writing equivalent forms of rational expressions to writing equivalent forms of rational numbers. | 1.2 Explain why a given value is non-permissible for a given rational expression. | 1.3 Determine the non-permissible values for a rational expression. | 1.4 Determine a rational expression that is equivalent to a given rational expression by multiplying the numerator and denominator by the same factor (limited to a monomial or a binomial), and state the non-permissible values of the equivalent rational expression.
TOP: Equivalent Rational Expressions KEY: rational expression | non-permissible value

30. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 4.2
OBJ: 1.5 Simplify a rational expression. | 1.6 Explain why the non-permissible values of a given rational expression and its simplified form are the same. | 1.7 Identify and correct errors in a given simplification of a rational expression, and explain the reasoning.
TOP: Simplifying Rational Expressions KEY: rational expression | non-permissible value

31. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 4.2
OBJ: 1.5 Simplify a rational expression. | 1.6 Explain why the non-permissible values of a given rational expression and its simplified form are the same. | 1.7 Identify and correct errors in a given simplification of a rational expression, and explain the reasoning.
TOP: Simplifying Rational Expressions KEY: rational expression | non-permissible value

32. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 4.3
OBJ: 2.1 Compare the strategies for performing a given operation on rational expressions to the strategies for performing the same operation on rational numbers. | 2.2 Determine the non-permissible values when performing operations on rational expressions. | 2.5 Determine, in simplified form, the product or quotient of two rational expressions.
TOP: Multiplying and Dividing Rational Expressions
KEY: rational expression | non-permissible value

33. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 4.3
OBJ: 2.1 Compare the strategies for performing a given operation on rational expressions to the strategies for performing the same operation on rational numbers. | 2.2 Determine the non-permissible values when performing operations on rational expressions. | 2.5 Determine, in simplified form, the product or quotient of two rational expressions.
TOP: Multiplying and Dividing Rational Expressions
KEY: rational expression | non-permissible value

34. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 4.4
OBJ: 2.1 Compare the strategies for performing a given operation on rational expressions to the strategies for performing the same operation on rational numbers. | 2.2 Determine the non-permissible values when performing operations on rational expressions. | 2.3 Determine, in simplified form, the sum or difference of rational expressions that have the same denominator. | 2.4 Determine, in simplified form, the sum or difference of two rational expressions that have different denominators. TOP: Adding and Subtracting Rational Expressions
KEY: rational expression | non-permissible value

35. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 5.1
OBJ: 7.1 Describe, orally and in written form, the characteristics of polynomial functions by analyzing their graphs. TOP: Exploring the graphs of polynomial functions
KEY: polynomial functions

36. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 5.2
OBJ: 7.2 Describe, orally and in written form, the characteristics of polynomial function by analyzing its equations. | 7.3 Match equations in a given set to their corresponding graphs.
TOP: Characteristics of the equations of polynomial functions
KEY: polynomial functions | leading coefficient

37. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 5.2
OBJ: 7.2 Describe, orally and in written form, the characteristics of polynomial function by analyzing its equations. | 7.3 Match equations in a given set to their corresponding graphs.
TOP: Characteristics of the equations of polynomial functions KEY: polynomial functions

38. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 5.2
OBJ: 7.2 Describe, orally and in written form, the characteristics of polynomial function by analyzing its equations. | 7.3 Match equations in a given set to their corresponding graphs.
TOP: Characteristics of the equations of polynomial functions
KEY: polynomial functions | end behaviour

39. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 5.4
OBJ: 7.4 Graph data and determine the polynomial function that best approximates the data. | 7.5 Interpret the graph of a polynomial function that models a situation, and explain the reasoning. | 7.6 Solve, using technology, a contextual problem that involves data that is best represented by graphs of polynomial functions, and explain the reasoning.
TOP: Modelling data with a curve of best fit KEY: scatter plot

40. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 5.4
OBJ: 7.4 Graph data and determine the polynomial function that best approximates the data. | 7.5 Interpret the graph of a polynomial function that models a situation, and explain the reasoning. | 7.6 Solve, using technology, a contextual problem that involves data that is best represented by graphs of polynomial functions, and explain the reasoning.
TOP: Modelling data with a curve of best fit
KEY: polynomial functions | curve of best fit

41. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 5.4
OBJ: 7.4 Graph data and determine the polynomial function that best approximates the data. | 7.5 Interpret the graph of a polynomial function that models a situation, and explain the reasoning. | 7.6 Solve, using technology, a contextual problem that involves data that is best represented by graphs of polynomial functions, and explain the reasoning.
TOP: Modelling data with a curve of best fit
KEY: polynomial functions | regression function

42. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 6.1
OBJ: 6.1 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its graph.
TOP: Exploring the characteristics of exponential functions KEY: exponential function

43. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 6.2
OBJ: 6.1 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its graph. | 6.2 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its equation. | 6.3 Match equations in a given set

to their corresponding graphs.
TOP: Relating the characteristics of an exponential function to its equation
KEY: exponential function

44. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 6.2
OBJ: 6.1 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its graph. | 6.2 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its equation. | 6.3 Match equations in a given set to their corresponding graphs.
TOP: Relating the characteristics of an exponential function to its equation
KEY: exponential function

45. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 6.2
OBJ: 6.1 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its graph. | 6.2 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its equation. | 6.3 Match equations in a given set to their corresponding graphs.
TOP: Relating the characteristics of an exponential function to its equation
KEY: exponential function

46. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 6.2
OBJ: 6.1 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its graph. | 6.2 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its equation. | 6.3 Match equations in a given set to their corresponding graphs.
TOP: Relating the characteristics of an exponential function to its equation
KEY: exponential function

47. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 6.3
OBJ: 5.1 Determine the solution of an exponential equation in which the bases are powers of one another. | 5.2 Determine the solution of an exponential equation in which the bases are not powers of one another. TOP: Solving exponential equations KEY: exponential function

48. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 6.3
OBJ: 5.1 Determine the solution of an exponential equation in which the bases are powers of one another. | 5.2 Determine the solution of an exponential equation in which the bases are not powers of one another. TOP: Solving exponential equations KEY: exponential function

49. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 6.3
OBJ: 5.1 Determine the solution of an exponential equation in which the bases are powers of one another. | 5.2 Determine the solution of an exponential equation in which the bases are not powers of one another. TOP: Solving exponential equations KEY: exponential function

50. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 6.3
OBJ: 5.1 Determine the solution of an exponential equation in which the bases are powers of one another. | 5.2 Determine the solution of an exponential equation in which the bases are not powers of one another. TOP: Solving exponential equations KEY: exponential function

51. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 6.3
OBJ: 5.1 Determine the solution of an exponential equation in which the bases are powers of one another. | 5.2 Determine the solution of an exponential equation in which the bases are not powers of one another. TOP: Solving exponential equations KEY: exponential function

52. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 6.4
OBJ: 6.4 Graph data and determine the exponential or logarithmic function that best

approximates the data. | 6.5 Interpret the graph of an exponential or logarithmic function that models a situation, and explain the reasoning. | 6.6 Solve, using technology, a contextual problem that involves data that is best represented by graphs of exponential or logarithmic functions, and explain the reasoning. TOP: Modelling data using exponential functions
KEY: exponential function | regression function

53. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 6.4
OBJ: 6.4 Graph data and determine the exponential or logarithmic function that best approximates the data. | 6.5 Interpret the graph of an exponential or logarithmic function that models a situation, and explain the reasoning. | 6.6 Solve, using technology, a contextual problem that involves data that is best represented by graphs of exponential or logarithmic functions, and explain the reasoning. TOP: Modelling data using exponential functions
KEY: exponential function | regression function

54. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 6.5
OBJ: 5.1 Determine the solution of an exponential equation in which the bases are powers of one another. | 5.2 Determine the solution of an exponential equation in which the bases are not powers of one another. | 5.3 Solve problems that involve the application of exponential equations to loans, mortgages and investments.
TOP: Financial applications involving exponential functions KEY: exponential function

55. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 6.5
OBJ: 5.1 Determine the solution of an exponential equation in which the bases are powers of one another. | 5.2 Determine the solution of an exponential equation in which the bases are not powers of one another. | 5.3 Solve problems that involve the application of exponential equations to loans, mortgages and investments.
TOP: Financial applications involving exponential functions
KEY: exponential function | compounding period

56. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 7.1
OBJ: 4.1 Express a logarithmic equation as an exponential equation and vice versa. | 6.1 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its graph. | 6.2 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its their equation. | 6.3 Match equations in a given set to their corresponding graphs.
TOP: Characteristics of logarithmic functions with base 10 and base e
KEY: logarithmic function

57. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 7.1
OBJ: 4.1 Express a logarithmic equation as an exponential equation and vice versa. | 6.1 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its graph. | 6.2 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its their equation. | 6.3 Match equations in a given set to their corresponding graphs.
TOP: Characteristics of logarithmic functions with base 10 and base e
KEY: logarithmic function

58. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 7.1
OBJ: 4.1 Express a logarithmic equation as an exponential equation and vice versa. | 6.1 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its graph. | 6.2 Describe, orally and in written form, the characteristics of an exponential or logarithmic function by analyzing its their equation. | 6.3 Match equations in a

given set to their corresponding graphs.
TOP: Characteristics of logarithmic functions with base 10 and base e
KEY: logarithmic function | exponential function

59. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 7.2
OBJ: 4.1 Express a logarithmic equation as an exponential equation and vice versa. | 4.2 Determine the value of a logarithmic expression, such as log_2 8, without technology. | 4.5 Determine the approximate value of a logarithmic expression, such as log_2 9, with technology.
TOP: Evaluating logarithmic expressions KEY: logarithmic function

60. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 7.2
OBJ: 4.1 Express a logarithmic equation as an exponential equation and vice versa. | 4.2 Determine the value of a logarithmic expression, such as log_2 8, without technology. | 4.5 Determine the approximate value of a logarithmic expression, such as log_2 9, with technology.
TOP: Evaluating logarithmic expressions KEY: logarithmic function

61. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 7.2
OBJ: 4.1 Express a logarithmic equation as an exponential equation and vice versa. | 4.2 Determine the value of a logarithmic expression, such as log_2 8, without technology. | 4.5 Determine the approximate value of a logarithmic expression, such as log_2 9, with technology.
TOP: Evaluating logarithmic expressions KEY: logarithmic function

62. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 7.2
OBJ: 4.1 Express a logarithmic equation as an exponential equation and vice versa. | 4.2 Determine the value of a logarithmic expression, such as log_2 8, without technology. | 4.5 Determine the approximate value of a logarithmic expression, such as log_2 9, with technology.
TOP: Evaluating logarithmic expressions KEY: logarithmic function

63. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 7.2
OBJ: 4.1 Express a logarithmic equation as an exponential equation and vice versa. | 4.2 Determine the value of a logarithmic expression, such as log_2 8, without technology. | 4.5 Determine the approximate value of a logarithmic expression, such as log_2 9, with technology.
TOP: Evaluating logarithmic expressions KEY: logarithmic function

64. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 7.2
OBJ: 4.1 Express a logarithmic equation as an exponential equation and vice versa. | 4.2 Determine the value of a logarithmic expression, such as log_2 8, without technology. | 4.5 Determine the approximate value of a logarithmic expression, such as log_2 9, with technology.
TOP: Evaluating logarithmic expressions KEY: logarithmic function

65. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 7.3
OBJ: 4.3 Develop the laws of logarithms, using numeric examples and the exponent laws. | 4.4 Determine an equivalent expression for a logarithmic expression by applying the Solving exponential equations using logarithms. TOP: Laws of logarithms
KEY: logarithmic function

66. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 7.3
OBJ: 4.3 Develop the laws of logarithms, using numeric examples and the exponent laws. | 4.4 Determine an equivalent expression for a logarithmic expression by applying the Solving exponential equations using logarithms. TOP: Laws of logarithms
KEY: logarithmic function

67. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 7.3
OBJ: 4.3 Develop the laws of logarithms, using numeric examples and the exponent laws. | 4.4 Determine an equivalent expression for a logarithmic expression by applying the Solving

exponential equations using logarithms. TOP: Laws of logarithms
KEY: logarithmic function

68. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 7.4
OBJ: 5.2 Determine the solution of an exponential equation in which the bases are not powers of one another. | 5.3 Solve problems that involve the application of exponential equations to loans, mortgages and investments.
TOP: Solving exponential equations using logarithms KEY: logarithmic function

69. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 7.4
OBJ: 5.2 Determine the solution of an exponential equation in which the bases are not powers of one another. | 5.3 Solve problems that involve the application of exponential equations to loans, mortgages and investments.
TOP: Solving exponential equations using logarithms KEY: logarithmic function

70. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 7.4
OBJ: 5.2 Determine the solution of an exponential equation in which the bases are not powers of one another. | 5.3 Solve problems that involve the application of exponential equations to loans, mortgages and investments.
TOP: Solving exponential equations using logarithms KEY: logarithmic function

71. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 7.5
OBJ: 6.4 Graph data and determine the exponential or logarithmic function that best approximates the data. | 6.5 Interpret the graph of an exponential or logarithmic function that models a situation, and explain the reasoning. | 6.6 Solve, using technology, a contextual problem that involves data that is best represented by graphs of exponential or logarithmic functions, and explain the reasoning. TOP: Modelling data using logarithmic functions
KEY: logarithmic function | regression function

72. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 8.1
TOP: Understanding angles KEY: radian

73. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 8.1
TOP: Understanding angles KEY: radian

74. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 8.2
OBJ: 8.1 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs. TOP: Exploring graphs of periodic functions
KEY: periodic function

75. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 8.2
OBJ: 8.1 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs. TOP: Exploring graphs of periodic functions
KEY: periodic function

76. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 8.3
OBJ: 8.1 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs. | 8.2 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their equations. | 8.3 Match equations in a given set to their corresponding graphs. TOP: The graphs of sinusoidal functions
KEY: sinusoidal function | midline

77. ANS: C PTS: 1 DIF: Grade 12 REF: Lesson 8.3
OBJ: 8.1 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs. | 8.2 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their equations. | 8.3 Match equations in a given set to their corresponding

graphs. TOP: The graphs of sinusoidal functions
KEY: sinusoidal function | amplitude

78. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 8.3
OBJ: 8.1 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs. | 8.2 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their equations. | 8.3 Match equations in a given set to their corresponding graphs. TOP: The graphs of sinusoidal functions
KEY: sinusoidal function | period

79. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 8.3
OBJ: 8.1 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs. | 8.2 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their equations. | 8.3 Match equations in a given set to their corresponding graphs. TOP: The graphs of sinusoidal functions KEY: sinusoidal function

80. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 8.3
OBJ: 8.1 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs. | 8.2 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their equations. | 8.3 Match equations in a given set to their corresponding graphs. TOP: The graphs of sinusoidal functions
KEY: sinusoidal function | amplitude | midline

81. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 8.4
OBJ: 8.1 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs. | 8.2 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their equations. | 8.3 Match equations in a given set to their corresponding graphs. TOP: The equations of sinusoidal functions
KEY: sinusoidal function | amplitude

82. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 8.4
OBJ: 8.1 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs. | 8.2 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their equations. | 8.3 Match equations in a given set to their corresponding graphs. TOP: The equations of sinusoidal functions
KEY: sinusoidal function | period

83. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 8.4
OBJ: 8.1 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs. | 8.2 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their equations. | 8.3 Match equations in a given set to their corresponding graphs. TOP: The equations of sinusoidal functions KEY: sinusoidal function

84. ANS: B PTS: 1 DIF: Grade 12 REF: Lesson 8.4
OBJ: 8.1 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs. | 8.2 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their equations. | 8.3 Match equations in a given set to their corresponding graphs. TOP: The equations of sinusoidal functions
KEY: sinusoidal function | amplitude

85. ANS: A PTS: 1 DIF: Grade 12 REF: Lesson 8.4
OBJ: 8.1 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs. | 8.2 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their equations. | 8.3 Match equations in a given set to their corresponding

graphs. TOP: The equations of sinusoidal functions
KEY: sinusoidal function | period

86. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 8.4
OBJ: 8.1 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their graphs. | 8.2 Describe, orally and in written form, the characteristics of sinusoidal functions by analyzing their equations. | 8.3 Match equations in a given set to their corresponding graphs. TOP: The equations of sinusoidal functions
KEY: sinusoidal function | midline

87. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 8.5
OBJ: 8.4 Graph data and determine the sinusoidal function that best approximates the data. | 8.5 Interpret the graph of a sinusoidal function that models a situation, and explain the reasoning. | 8.6 Solve, using technology, a contextual problem that involves data that is best represented by graphs of sinusoidal functions, and explain the reasoning.
TOP: Modelling data with sinusoidal functions
KEY: sinusoidal function | extrapolate

88. ANS: D PTS: 1 DIF: Grade 12 REF: Lesson 8.5
OBJ: 8.4 Graph data and determine the sinusoidal function that best approximates the data. | 8.5 Interpret the graph of a sinusoidal function that models a situation, and explain the reasoning. | 8.6 Solve, using technology, a contextual problem that involves data that is best represented by graphs of sinusoidal functions, and explain the reasoning.
TOP: Modelling data with sinusoidal functions
KEY: sinusoidal function | regression function | extrapolate