LSB

Grade 8 Math Final Exam – June 2011 – Answer Key

Section 1: Non-Calculator

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

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

Section 2: Calculator

11.	B
12.	A
13.	D
14.	C
15.	C
16.	D
17.	A
18.	C
19.	D
20.	D

21.	C
22.	B
23.	B
24.	C
25.	B
26.	C
27.	A
28	D
29.	B
30.	C

31.	B
32.	B
33.	D
34.	C
35.	C
36.	B
37.	A
38.	C
39.	A
40.	D

Section 1: Constructed Response [10 Marks]

Write your answers in the space provided. Show all workings to achieve full marks.
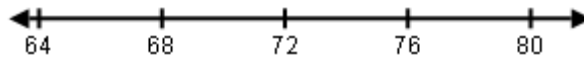
1. Explain how you would estimate the square root of 68.   [3 Marks]

    <u>One possible answer:</u>

    $\sqrt{68}$ is between the perfect squares 64 and 81, thus $\sqrt{68}$ must be between 8 and 9.

    68 is about one quarter the way between 64 and 81.

    i.e.

    Therefore, $\sqrt{68}$ is about $\frac{1}{4}$ the way between 8 and 9.

    I estimate $\sqrt{68}$ to be about 8.25, which is about 8.3 to one decimal place.

    <u>Another possible answer:</u>

    $\sqrt{68}$ is between the perfect squares 64 and 81, thus $\sqrt{68}$ must be between 8 and 9.

    I multiplied 8.2 by 8.2 and got 67.24

    Therefore, I estimate $\sqrt{68}$ to be about 8.2 to one decimal place.

2. Sketch a model (i.e. counters, number line, etc.) to calculate $(+4)\times(-3)$.

                                                                     [2 Marks]

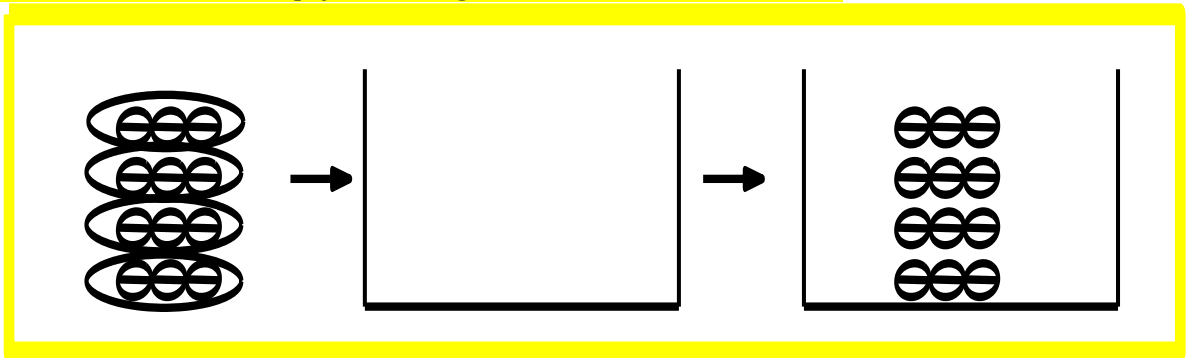   <u>One possible answer:</u>

    4 groups of -3 which is -12

    <u>Another possible answer:</u>

    Add 4 sets of -3 to an empty bank to get a total of -12 in the bank.

3. Jenna tells Jason that she knows that $4\frac{1}{2} \times 8\frac{1}{5}$ is greater than 36 before she actually performs the formal calculation. How might Jenna explain this to Jason?

[3 Marks]

One possible answer:

$4\frac{1}{2}$ times 8 is 36, so $4\frac{1}{2}$ times a number > than 8 (i.e. $8\frac{1}{5}$) must be greater than 36.

Another possible answer:

4 times 8 is 32 and $\frac{1}{2}$ times $8\frac{1}{5}$ is greater than 4. So $4\frac{1}{2}$ times $8\frac{1}{5}$ must be greater than 36.

4. Solve this equation. Show all your work. [2 Marks]

$$2(x+3) = -14$$

$2(x+3) = -14$
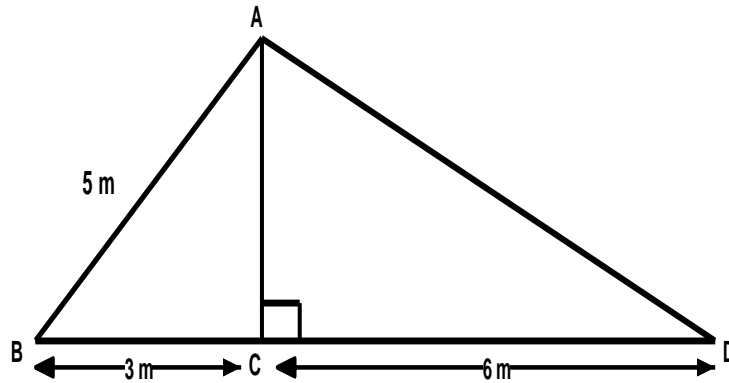
$2x + 6 = -14$
$2x + 6 - 6 = -14 - 6$
$2x = -20$
$\frac{2x}{2} = \frac{-20}{2}$
$x = -10$

Section 2: Constructed Response [30 Marks]

Write your answers in the spaces provided. Show all workings to achieve full marks.

5. Determine the length of AD to one decimal place.   [3 Marks]

$$(AC)^2 + 3^2 = 5^2$$

$$(AC)^2 + 9 = 25$$

$$(AC)^2 = 16$$

$$AC = 4$$

$$(AC)^2 + (CD)^2 = (AD)^2$$

$$4^2 + 6^2 = (AD)^2$$

$$52 = (AD)^2$$

$$AD = \sqrt{52}$$

$$AD \approx 7.2m$$

6. Calculate: $\dfrac{7}{10} + \dfrac{3}{5} \times \left(\dfrac{2}{3} \div \dfrac{1}{2} \right)$ [3 Marks]

$$\frac{7}{10} + \frac{3}{5} \times \left(\frac{2}{3} \div \frac{1}{2} \right)$$

$$\frac{7}{10} + \frac{3}{5} \times \left(\frac{2}{3} \times \frac{2}{1} \right)$$

$$\frac{7}{10} + \frac{3}{5} \times \frac{4}{3}$$

$$\frac{7}{10} + \frac{4}{5}$$

$$\frac{7}{10} + \frac{4}{5} \cdot \frac{2}{2}$$

$$\frac{7}{10} + \frac{8}{10}$$

$$\frac{15}{10}$$

$$\frac{3}{2} \quad (OR\, 1\frac{1}{2})$$

7. These containers are made from the same material. How much chocolate can each
   container hold? Show your work.   [3 Marks]

diameter = 3.8 cm

Tootsie Roll

10.6 cm

3.4 cm

TOBLERONE

11.8 cm

5.8 cm

Volume of Tootsie Roll Cylinder:

$$V = \pi r^2 h$$
$$= 3.14 \cdot (1.9)^2 \cdot 10.6$$
$$\approx 120.2 \; cm^3$$

Volume of Toblerone Triangular Prism:

$$V = base \; area \times height$$
$$= \frac{1}{2}(5.8)(3.4)(11.8)$$
$$\approx 116.3 \; cm^3$$

8. These cans hold the same amount of tuna. Which can uses more metal? Show your
   work.   [3 Marks]

10.0 cm

StarKist
Solid White
ALBACORE TUNA IN WATER

4.5 cm

7.5 cm

PRINCES

Tuna Chunks
In Sunflower Oil

8.0 cm

Surface area of StarKist can:

$$SA = 2\pi r^2 + 2\pi rh$$
$$= 2(3.14)(5)^2 + 2(3.14)(5)(4.5)$$
$$= 157 + 141.3$$
$$= 298.3 \; cm^2$$

Surface area of Princes can:

$$SA = 2\pi r^2 + 2\pi rh$$
$$= 2(3.14)(3.75)^2 + 2(3.14)(3.75)(8.0)$$
$$= 88.3 + 188.4$$
$$= 276.7 \; cm^2$$

Therefore, the StarKist can of tuna uses the most metal.

9. Janine is purchasing a set of golf clubs that are priced at $425.00. The salesman tells her that the set is on sale for 13% off. The tax rate is also 13%. Janine thinks she will pay exactly $425.00 for the set of clubs. Is she correct? Justify your answer.

[3 Marks]

No, she's not correct. She's thinking that the discount of 13% and the tax rate of 13% will "cancel" each other out so that she will pay the ticket price of $425. However, the correct calculation of what she needs to pay is as follows:

$425 \times 0.13 = 55.25 \ (discount)$

$425 - 55.25 = 369.75 \ (price \ before \ taxes)$

$369.75 \times 0.13 = 48.07 \ (taxes)$

$369.75 + 48.07 = 417.82$

Janine will actually pay $417.82 for the set of golf clubs.

10. Fred found his favourite shampoo in two stores. The sizes and pricing are shown below. Which bottle is the better value? Show your work.   [3 Marks]

750 ml for $3.00   1 000 ml for $4.20

One possible answer:

$\dfrac{3}{750} = 0.004$ $\dfrac{4.20}{1000} = 0.0042$

i.e. paying 0.004 cents per ml   i.e. paying 0.0042 cents per ml

Thus, the 750 ml bottle for $3.00 is the better value.

11. An iceberg 80 m in length is 10 m above the water's surface and 70 m below the water's surface. What is the total length of a similar iceberg that rises 17 m above the water's surface? Show your work. [3 Marks]
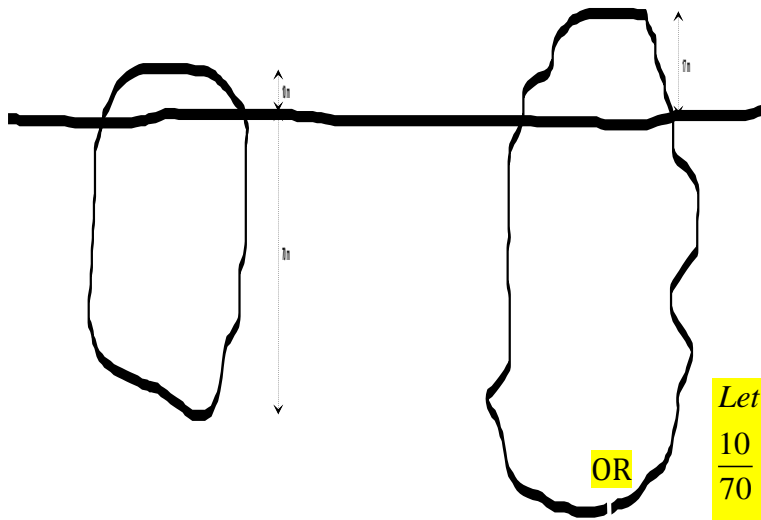
Let x be length of bigger iceberg.

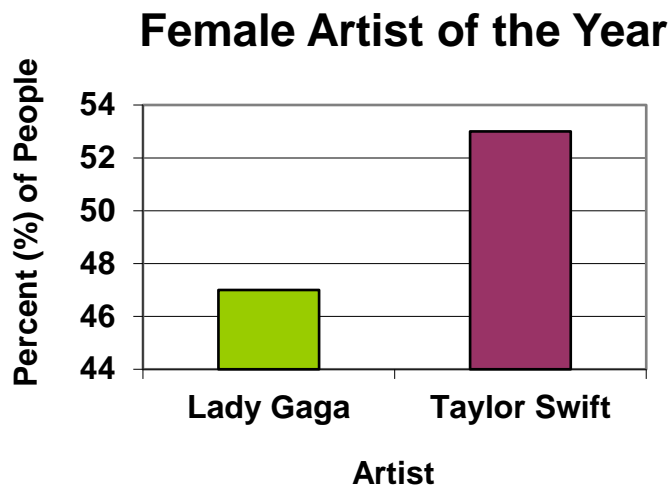$$\frac{10}{80} = \frac{17}{x} \rightarrow 10x = (17)(80)$$

$$\rightarrow 10x = 1360 \rightarrow x = \frac{1360}{10} = 136\,m$$

Let y be part of bigger iceberg under water

$$\frac{10}{70} = \frac{17}{y} \rightarrow 10y = (17)(70)$$

$$\rightarrow 10y = 1190 \rightarrow y = \frac{1190}{10} = 119\,m \rightarrow 119 + 17 = 136\,m$$

OR

12. The online voting results for a music award were displayed to the television viewing audience using this graph:

Female Artist of the Year

Percent (%) of People

54	
52	
50	
48	
46	
44	

Lady Gaga   Taylor Swift

Artist

Is this a fair way of presenting the data? Briefly explain your answer. [2 Marks]

No, this is not a fair way of presenting the data. The vertical axis (y) does not start at 0 leaving some to think that by looking at the bars, Taylor Swift has about 3 times more votes than Lady Gaga. In fact, the voting was fairly close. i.e. 47% and 53%.

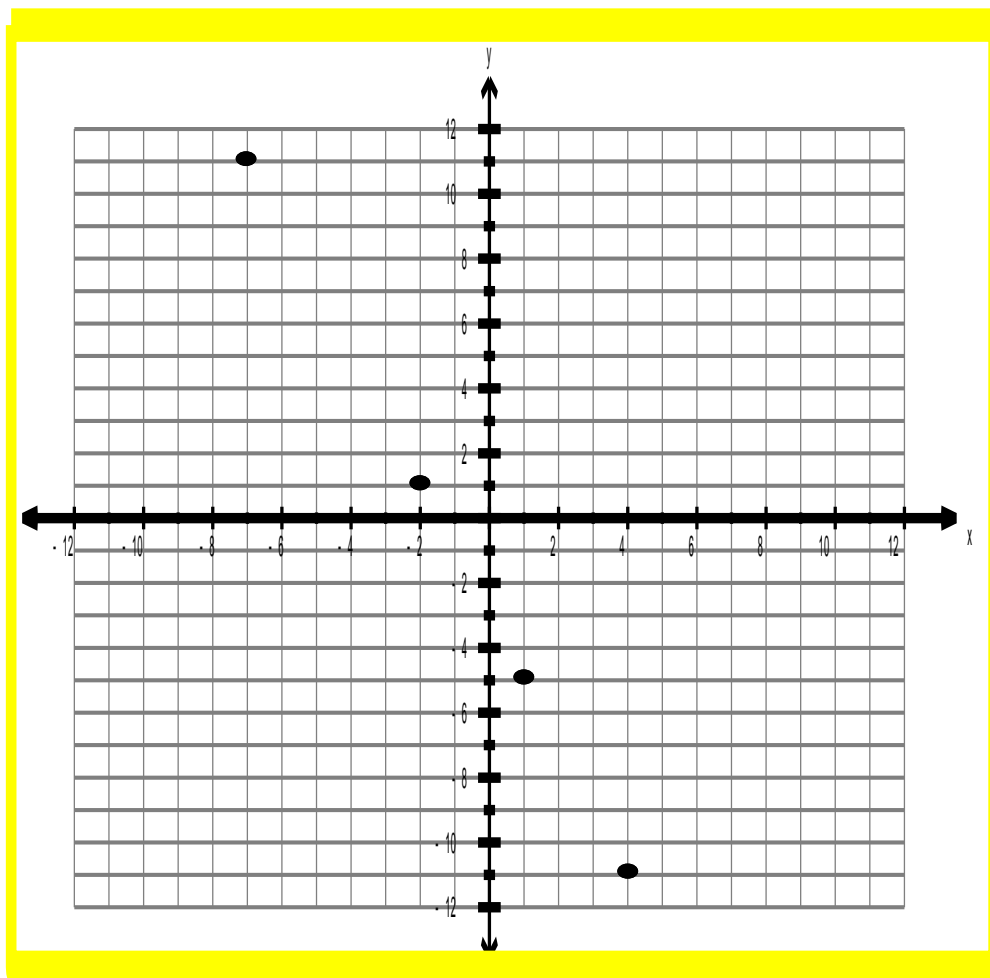13. The equation of a linear relation is: $y = -2x - 3$

A. Complete this table of values for the relation. [1Mark]

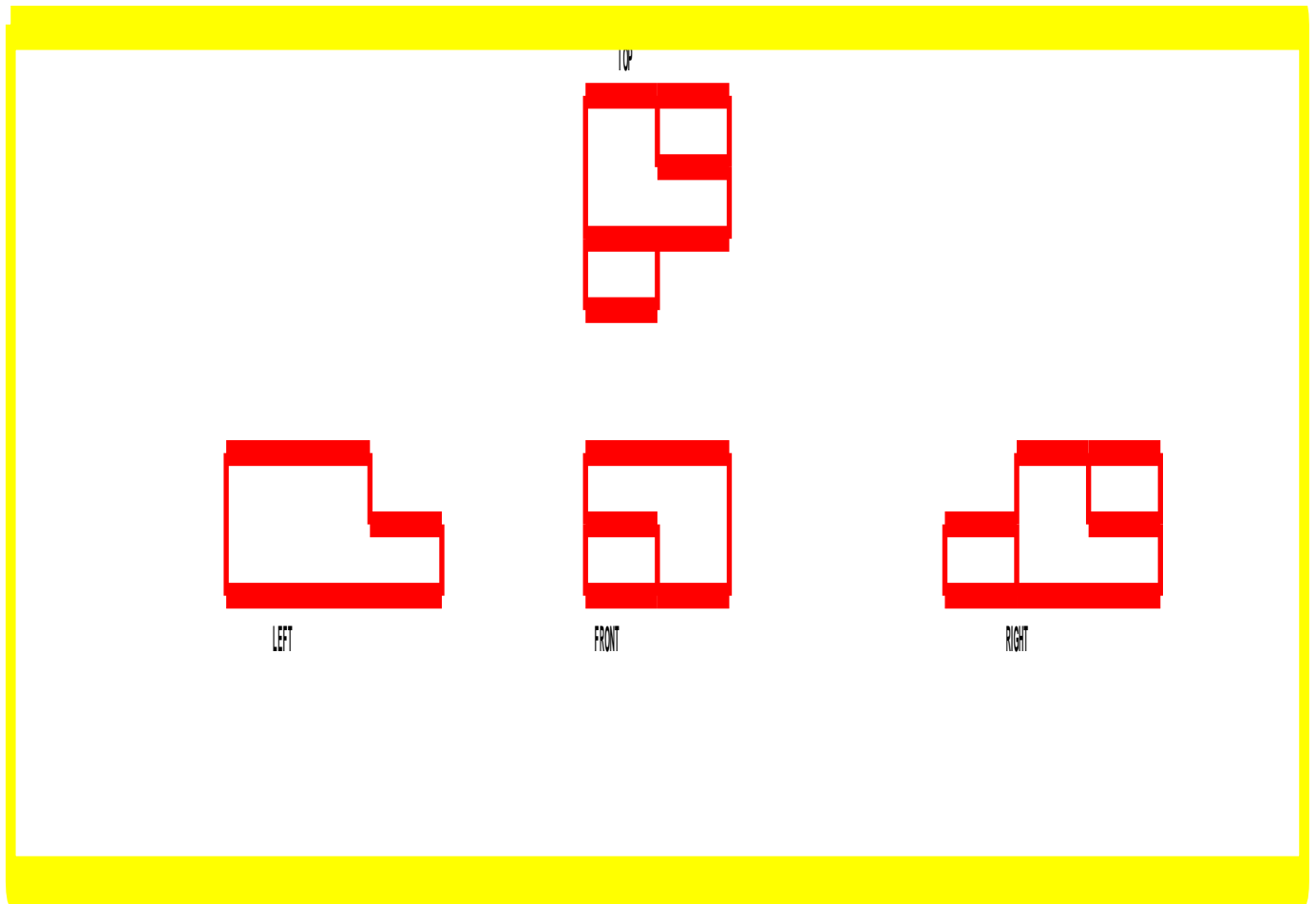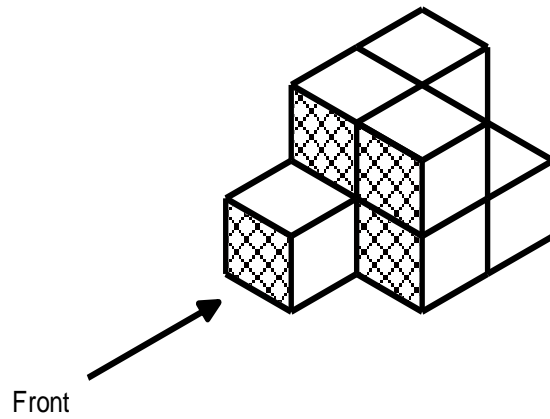| x	y
-7	11
-2	1
1	-5
4	-11

B. Graph the data from the table in part A on the grid below. [1 Mark]

14. Sketch and label the front, top, left side and right side views of the object.

[2 Marks]

Front

TOP

LEFT   FRONT   RIGHT

15. Can you combine dodecagons with other regular polygons to create tessellations?
     Use the table below to help explain your answer.   [3 marks]

                                                                          [3 Marks]

Polygon	Interior angle measure
Triangle	60°
Square	90°
Pentagon	108°
Hexagon	120°
Octagon	135°
Decagon	144°
Dodecagon	150°

Yes, you can combine a regular dodecagon with other regular polygons to create tessellations. The sum of the measures of the angles at any point where vertices meet must be 360° in order for combinations of polygons to tessellate.

-   Two dodecagons and a triangle at each vertex (150°+150°+60°=360°)

-   One dodecagon, a square, and a hexagon at each vertex (150°+90°+120°=360°)