

# Academic



## Grade 9 Assessment of Mathematics

Winter 2006

1. Asha receives \$10 000.

Asha keeps **half** his money and gives **the rest** to Bertha.



Bertha keeps **half** her money and gives **the rest** to Calvin.

Calvin keeps **half** his money and gives **the rest** to Dane.

Dane keeps **half** his money and gives **the rest** to Evanna.

Which expression shows the dollar amount of money that **Evanna** receives from Dane?

- a  $10\ 000 \div 2^4 *$
- b  $5000 \times \frac{1}{2} \times \frac{1}{2}$
- c  $10\ 000 \div \frac{1}{2} \div \frac{1}{2} \div \frac{1}{2} \div \frac{1}{2}$
- d  $2500 \div 2$

2. With \$12.00, Sam and a friend are buying lunch from the menu below.

<i>Menu</i>	
<u>Soups and Salads</u>	
Tomato Soup	\$1.95
Green Salad	\$2.25
<u>Sandwiches</u>	
Ham & Cheese	\$4.65
Turkey	\$5.15
Hamburger	\$3.45
<u>Beverages</u>	
Soft Drink	\$1.35
Tea/Coffee	\$0.99
Juice	\$1.75
 Tax included 	

Which of the following orders could they buy with their \$12.00?

- a two soft drinks and two turkey sandwiches
- b one tomato soup, one tea and two ham and cheese sandwiches
- c one tomato soup, one juice, two green salads and one hamburger \*
- d one soft drink, one tea, one turkey sandwich and one ham and cheese sandwich

3. If  $x = 3$ , what is the value of  $2x^2 + 5x$ ?
- a 21
  - b 27
  - c 33 \*
  - d 51
4. The cost,  $C$ , in dollars to print  $n$  leaflets is given by the formula
- $$C = 35 + 0.03n.$$

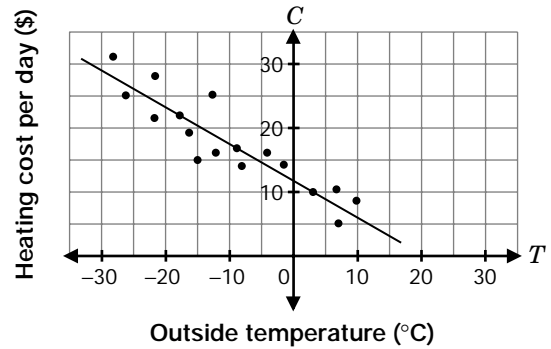


What is the cost of printing 900 leaflets?

- a \$27.00
- b \$35.00
- c \$37.70
- d \$62.00 \*

5. Duncan records the outside temperature at noon each day. He also records the heating cost per day. The graph shows a scatter plot and a line of best fit for his data.

Heating Cost per Day vs. Outside Temperature

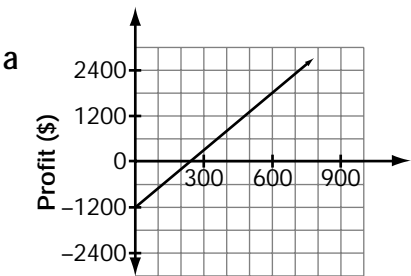


By approximately how much does the heating cost per day **decrease** when the outside temperature increases **by 5°**?

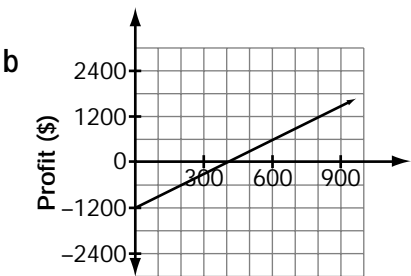
- a \$1
- b \$3 \*
- c \$5
- d \$7

6. A student council is selling tickets to a video dance for \$5 each. The cost of the disc jockey and the equipment is \$1200.

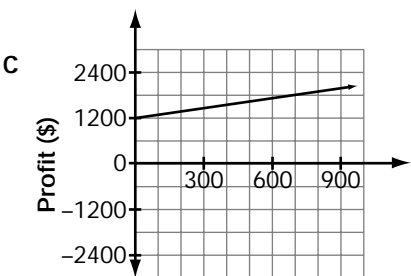
Which of the following graphs represents the relationship between the profit in dollars made by the student council and the number of tickets sold?



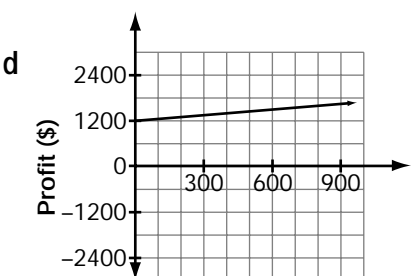
Number of tickets sold



Number of tickets sold



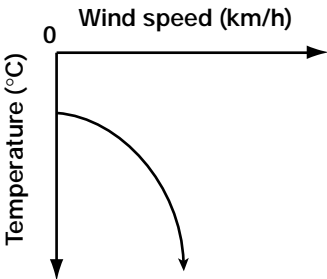
Number of tickets sold



Number of tickets sold

7. The graph below shows a **non-linear** relationship between temperature and wind speed.

Temperature vs. Wind Speed



Which table of values represents this non-linear relationship?

a

Wind speed (km/h)	Temperature (°C)
0	-20
10	-30
20	-40
30	-50

b

Wind speed (km/h)	Temperature (°C)
0	-20
10	-25
20	-35
30	-50

c

Wind speed (km/h)	Temperature (°C)
0	-20
10	-40
20	-60
30	-80

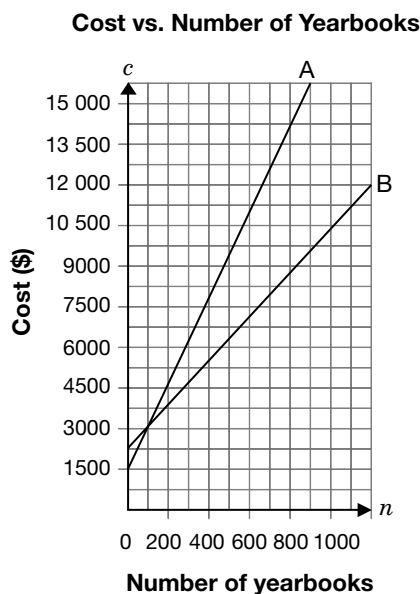
d

Wind speed (km/h)	Temperature (°C)
0	-20
10	-35
20	-50
30	-65

8. The **total cost of printing** yearbooks is made up of a **fixed setup cost**, plus a **cost per book**.

**Graph A** represents the total cost of printing the yearbooks **last** year.

**Graph B** represents the total cost of printing the yearbooks **this** year.



Which statement is **true**?

- a The fixed setup costs for printing yearbooks last year and this year are the same.
- b The fixed setup cost for printing yearbooks this year is lower than the fixed setup cost last year.
- c The cost per book for printing this year is more than the cost per book for printing last year.
- d The cost per book for printing last year is more than the cost per book for printing this year. \*

9. How many of these equations represent straight lines?

$$y = x - 2$$

$$y = 2 - 4x$$

$$y = x^2 + 8$$

- a one
- b two \*
- c three
- d none

10. Rearrange  $4y - x = 8$  so that it is in the form  $y = mx + b$ .

a  $y = x + 8$

b  $y = -x + 2$

c  $y = \frac{1}{4}x + 2$  \*

d  $y = -\frac{1}{4}x + 2$

11. What is the equation of the line that passes through the point  $(2, 0)$  and is parallel to the line  $y = -3x + 4$ ?

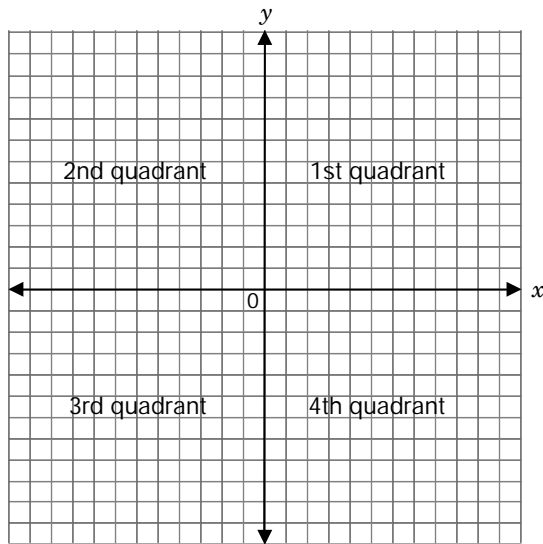
a  $y = 3x + 2$

b  $y = 3x + 6$

c  $y = -3x + 2$

d  $y = -3x + 6$  \*

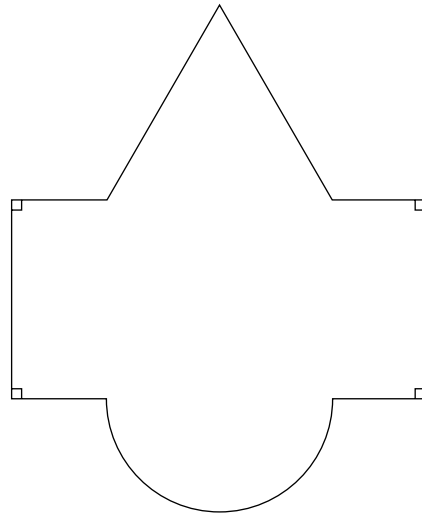
12. The equations  $y = -x - 5$  and  $y = 3$  represent straight lines that intersect.



In which quadrant do they intersect?

- a 1st
  - b 2nd \*
  - c 3rd
  - d 4th
13. If the diameter of a volleyball is three times the diameter of a tennis ball, which statement below is true?
- a The volume of the volleyball is 3 times the volume of the tennis ball.
  - b The volume of the volleyball is 9 times the volume of the tennis ball.
  - c The surface area of the volleyball is 9 times the surface area of the tennis ball. \*
  - d The surface area of the volleyball is 27 times the surface area of the tennis ball.

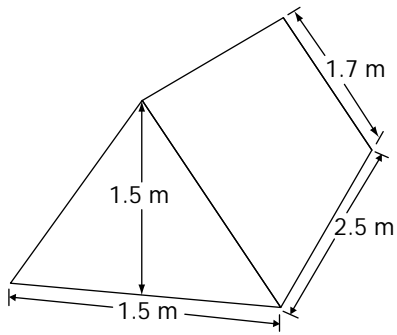
14. The floor plan of the lobby of a hotel is shown below.



Which of the following formulas is not useful to determine the area of part of the lobby?

- a  $\frac{b \times h}{2}$
- b  $\frac{\pi r^2}{2}$
- c  $\frac{4}{3} \pi r^3$  \*
- d  $l \times w$

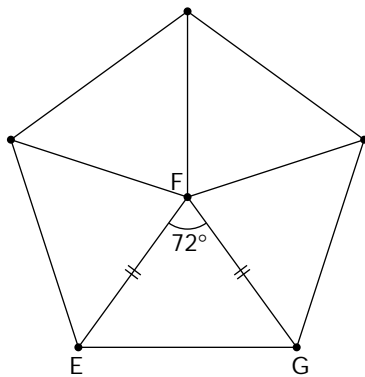
15. Examine the tent below.



Which of the following is the surface area of the tent, including the ends and the floor?

- a  $4.6 \text{ m}^2$
- b  $10.5 \text{ m}^2$
- c  $14.5 \text{ m}^2$  \*
- d  $20.0 \text{ m}^2$

16. Examine the figure below.



What is the measure of  $\angle FEG$ ?

- a  $36^\circ$
- b  $54^\circ$  \*
- c  $60^\circ$
- d  $72^\circ$

# 1. Thrill Rides

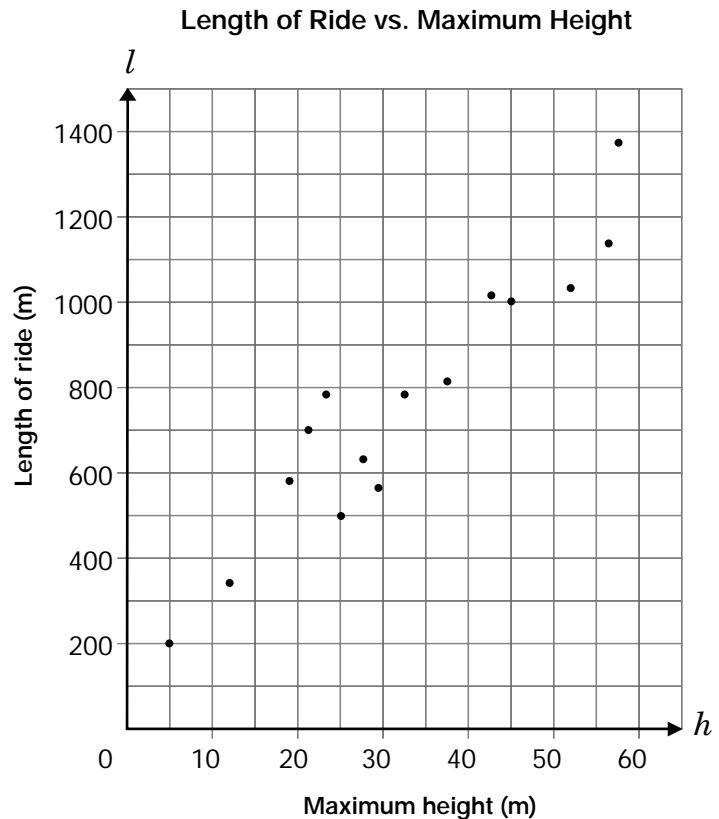
Susanna travels to different amusement parks to ride 15 roller coasters and collect data about each ride.



She constructs a scatter plot to show the relationship between the **total length** of the ride,  $l$ , in metres, and the **maximum height** of its peaks,  $h$ , in metres.

- a) Draw a **line of best fit** to represent the data.

- b) Determine an **equation** for your line of best fit. Justify your answer.





- c) Susanna rides another roller coaster. The **length** of the ride on this roller coaster is **500 m**.

Determine its **maximum height**, using your results from part a) or b).

Justify your answer.

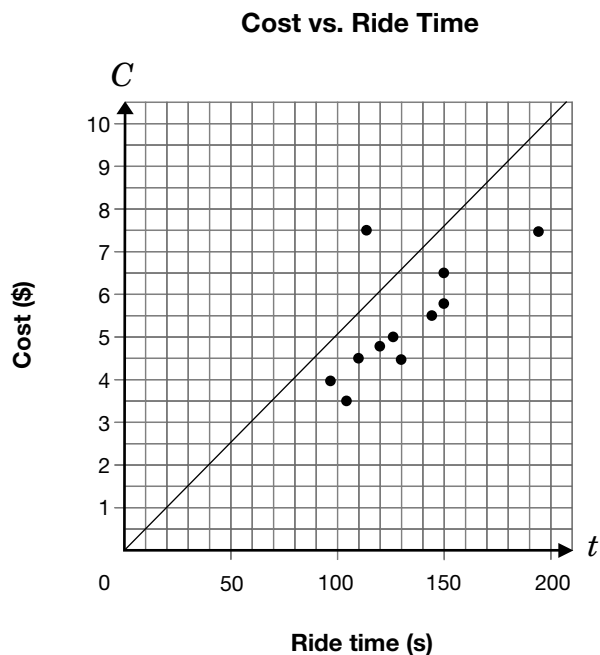
- d) Susanna collects data about the relationship between the **cost of each ride**,  $C$ , in dollars, and **the time the ride lasts**,  $t$ , in seconds. She plots the data on the graph below.

Susanna graphs the equation  $C = 0.05t$ .

She notices that its line is **not** the line of best fit.

Describe how to change the equation so that it represents the equation of a line of best fit for her data.

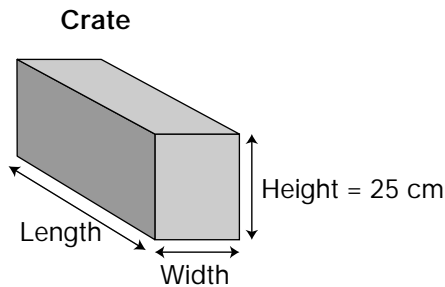
Justify your answer.



## 2. Calculating Crates

The Ultraflight Golf Ball Company is designing new shipping crates for its golf balls.

The company requires large crates with a volume of 64 000 cm<sup>3</sup> for shipping boxes of golf balls. The table below gives data about five different crates with heights of 25 cm.



	Length (cm)	Width (cm)	Height (cm)	Volume (cm <sup>3</sup> ) $V = lwh$	Surface area (cm <sup>2</sup> ) $SA = 2(wh + lw + lh)$
Crate 1	128	20	25	64 000	12 520
Crate 2	102.4	25	25	64 000	11 500
Crate 3	80	32	25	64 000	a)
Crate 4	64	40	25	64 000	10 320
Crate 5	50.6	50.6	25	64 000	10 180

a) Determine the surface area of Crate 3. Show your work.

Write your answer in the table above.

- b) In the table, Crate 5 has the **smallest** surface area.

Describe the **relationship** between its length and width that makes it have the smallest surface area.

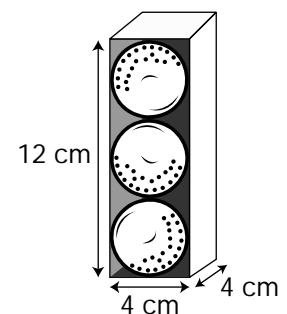
- c) The company designs a **new** crate with a **volume** of  $64\,000\text{ cm}^3$ . Its height is **40 cm**.

Use the relationship you found in b) to determine the **length and width** of the crate with the smallest surface area.

Justify your answer.

- d) Golf balls come in packages of three.  
The **radius** of each golf ball is **2 cm**.

How much **wasted space** (air) is in the package? Show your work.



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