568416 - Mathematics
Guide

1 B

2 In 15 weeks

3 Example of an appropriate solution

First offer

400 m^2 ÷ 40 m^2 = 10 times

10 × $1 = $10

Second offer

400 m^2 × 2.5 4 =

400 m^2 × $0.025 = $10

Final answer   Neither one is a better deal because each worker would charge the same amount for a 400-square-metre lawn.

4   Example of an appropriate solution

STATION 1	1000 + 100x
	5000 − 1000 = 4000
	4000 ÷ 100 = 40
⇒	40 segments of 30 seconds
STATION 2	2000 + 50x
	5000 − 2000 = 3000
	3000 ÷ 50 = 60
⇒	60 segments of 30 seconds
STATION 3	150x
	5000 ÷ 150 = 33.3
⇒	33.3 segments of 30 seconds

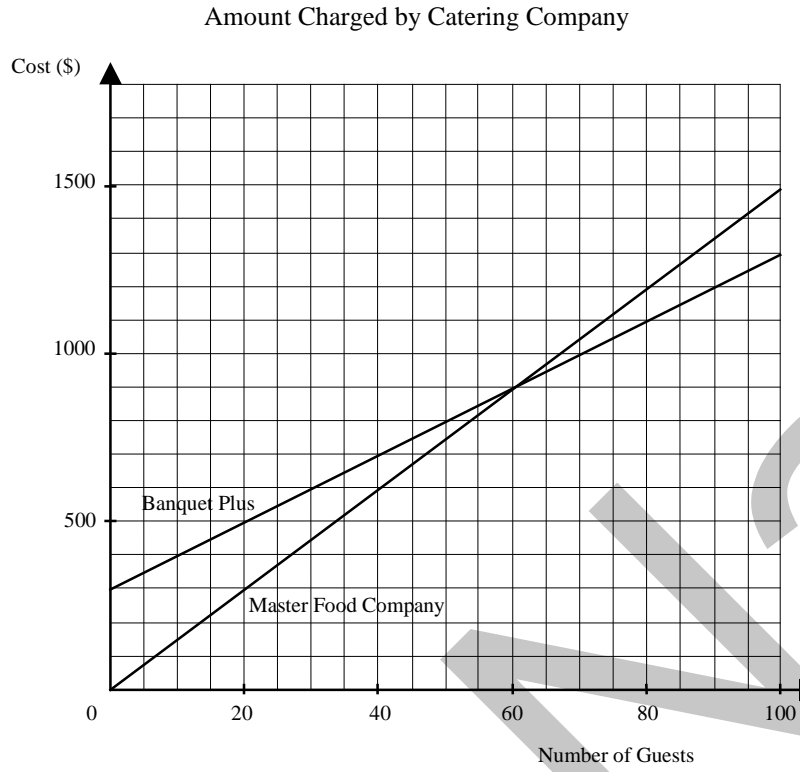Final answer   The second radio station offers the best deal.

5   Option 3 because it depends the most on the number of sales made.

Accept any equivalent justification.

Price before the discount $	Price after the discount at Tartan Boutique $	Price after the discount at Dimension $
0.00	0.00	0.00
20.00	17.00	16.00
25.00	21.25	20.00
35.00	29.75	28.00
60.00	51.00	48.00
100.00	85.00	80.00

6

7

Example of an appropriate solution

Amount Charged by Catering Company

Cost ($)

1500

1000

Banquet Plus

500

Master Food Company

0   20   40   60   80   100

Number of Guests

8

The length (*x*) is 24 cm.

9

D

10　B

11　B

12　D

2 Julie and Caroline are saving for their trip to Europe. Right now, Julie has $500 in a savings account and she plans to deposit $20 more each week.

Caroline only has $200 saved but she plans to deposit $40 each week into her account.

Julie's savings plan can be represented by the function $(20$n$ + 500) while Caroline's can be represented by the function $(40$n$ + 200), where n represents the number of weeks.

In how many weeks will the girls have saved the same amount of money?

3 Two lawn maintenance workers offer their services for the summer to the residents in a certain part of town. The first charges $1 per 40 square metres of lawn. The second charges 2.5 ¢ per square metre of lawn.

For a lawn that is 400 square metres, which offer is the best deal?

Show all the work needed to solve the problem.

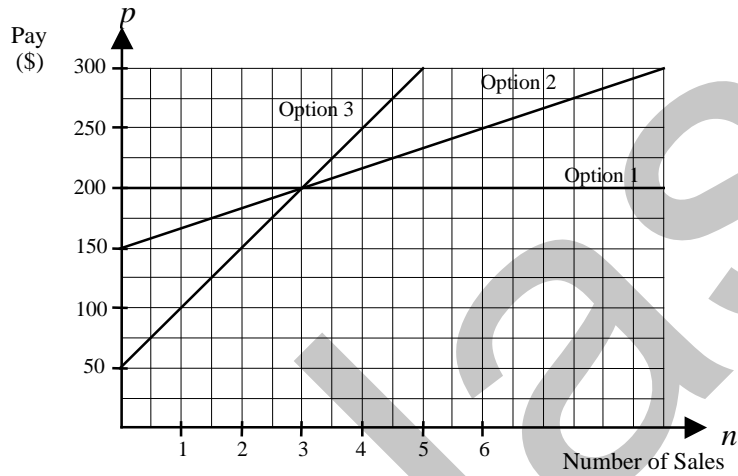| 4 | A restaurant owner must decide which of three radio stations will be given his publicity campaign. Each of these stations has the same number of listeners. The restaurant owner has $5000 to spend on publicity. |

- The first station charges $1000 for the advertisement plus $100 for every 30 seconds on the air.

- The second station charges $2000 for the advertisement plus $50 for every 30 seconds on the air.

- The third station doesn't charge for the advertisement but charges $150 for every 30 seconds on the air.

Which radio station should the restaurant owner choose if he wants the most air time for his money?

Show all the work needed to solve the problem.

5 A store manager is hiring sales people. During the interviews, he gives each candidate three different options of weekly pay.

Given that *n* is the number of sales and *p* is the amount of pay in dollars, the following graph shows the three options offered to the candidates:

Which option of weekly pay would encourage the greatest number of sales?

Justify your answer.

6 Melanie is shopping for a dress at the *Tartan Boutique*. Today everything is on sale for 15% off the regular price.

Marni is shopping at a unisex store called *Dimension*. Here the sale prices are shown in the table of values below.

Price before the discount $	Price after the discount at *Tartan Boutique* $	Price after the discount at *Dimension* $
0.00		
20.00		16.00
25.00		20.00
35.00		
60.00		
100.00		80.00

Represent this situation by completing the table of values in the Answer Booklet. Assume that there are no taxes.

7 | Carmen and Paolo are engaged to be married. They contacted two companies to cater their engagement party.

The *Banquet Plus Company* told them it charged $300 for the rental of the dishes, tables and chairs and $10 a person for food.

The *Master Food Catering Company* told them it charged $15 a person which included food and all rental charges.

Draw a graph which compares the cost charged by each company for a party of up to 100 guests.

8 | Pierre and Gordon are designing a rectangular flowerbed. Each designer used a different algebraic expression for the perimeter of the rectangle.
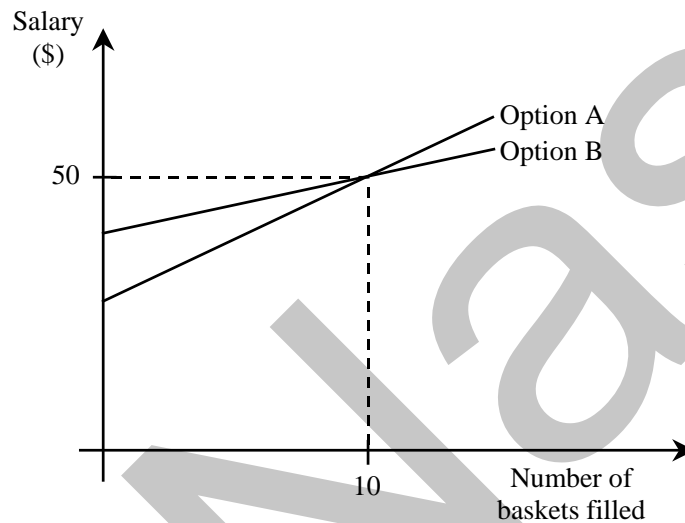
Pierre's expression for the perimeter $y = 2(x + 9)$

Gordon's expression for the perimeter $y = 3x - 6$

Calculate the length (x) of the rectangular flowerbed.

9 | The salary that a farmer pays his strawberry pickers can be determined according to two different options.

The following graph shows the relationship between the salary paid and the number of baskets of strawberries filled.
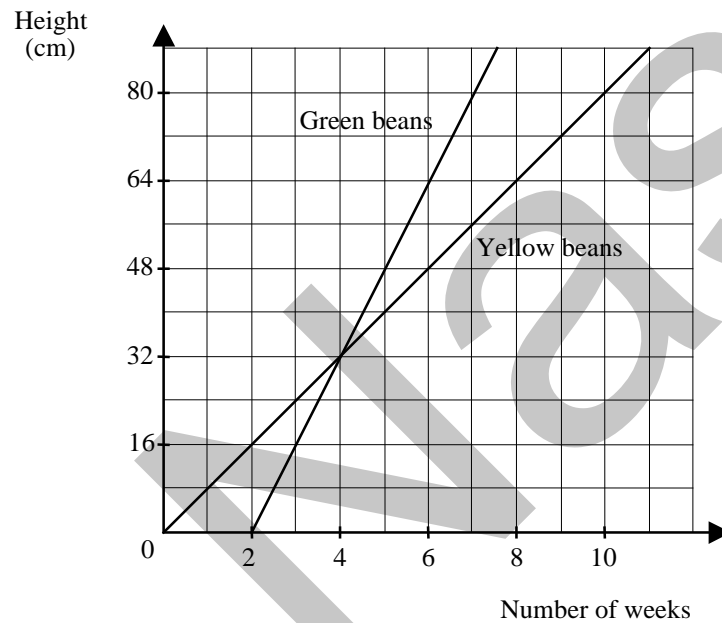

According to this graph, which one of the following statements is TRUE?

A) The base salary under option A is higher than the base salary under option B.

B) The amount paid for each basket filled is greater under option B than under option A.

C) If they fill between 8 and 15 baskets, workers get a better deal under option B.

D) Workers get a better deal under option A if they fill more than 10 baskets of strawberries.

10 | John makes a garden every year. He always plants the green beans two weeks after the yellow beans.

The following graph shows the relationship between the height of the beans in centimetres and the number of weeks elapsed since the planting of the yellow beans.

Height
(cm)

80 ─

64 ─

Green beans

48 ─

Yellow beans

32 ─

16 ─

0   2   4   6   8   10

Number of weeks

Which of the following statements is TRUE?

A)   Both types of beans reach the same height 2 weeks after the planting of the yellow beans.

B)   The growth rate of the green beans is greater than that of the yellow beans.

C)   The difference in height of the beans after each had been growing for 6 weeks is 2 cm.

D)   The yellow beans are taller than the green beans after each had been growing for 4 weeks.

11

Two companies offer to cut down trees. The cost depends on the time required for a given tree-cutting job. This situation is represented by the following system of relations:
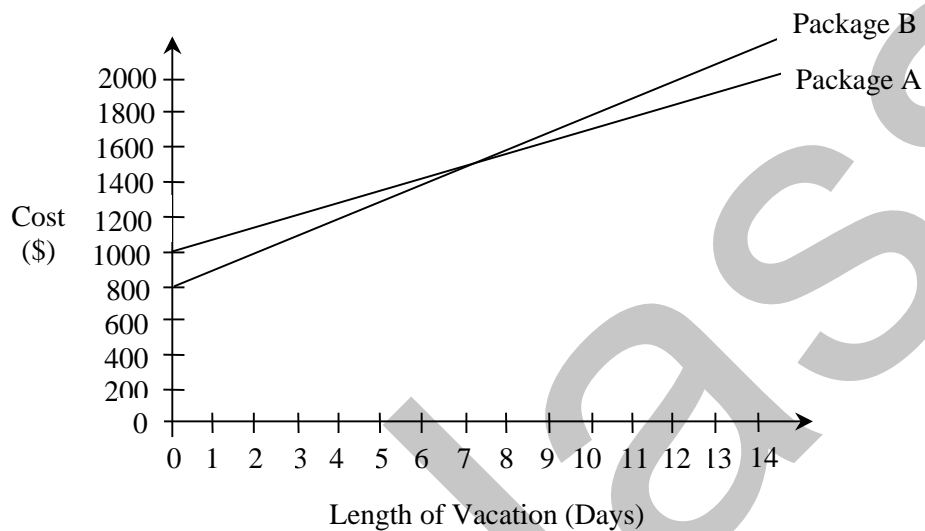
$$y_A = 115x + 50$$

$$y_B = 75x + 170$$

Where x: the time (in hours) needed to complete the tree cutting job

y_A: the cost (in dollars) if company A does the tree cutting job

y_B: the cost (in dollars) if company B does the tree cutting job

Which one of the following statements is TRUE?

A)   If the tree-cutting job takes 2.5 hours to complete, the cost is the same no matter which company is hired.

B)   If the tree-cutting job takes 6 hours to complete, you save $120 if you hire company B.

C)   If the tree-cutting job takes less than 4.5 hours to complete, it is cheaper to hire company A.

D)   If the tree-cutting job takes between 1 and 2 hours to complete, it is cheaper to hire company B.

12 Eric is planning a vacation. He is comparing the cost of vacation packages offered by two different travel agencies. The cost of each package consists of a fixed amount plus a daily rate and is shown by the following graph.

According to the graph, which of the following statements is FALSE?

A)   Package A is less expensive for trips that are more than a week long.

B)   The daily rate for Package B is higher than the daily rate for Package A.

C)   The difference between the base rates of the two packages is $200.

D)   A two-week vacation costs more with Package A than with Package B.