

# Academic

## Grade 9 Assessment of Mathematics

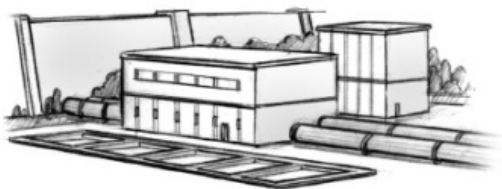
### Modeling Linear Relations Practice



Education  
Quality and  
Accountability  
Office

- 1 The charges on a monthly water bill are \$0.86 per  $\text{m}^3$  of water used plus a service charge of \$4.49.

Let  $C$  = total charge, in dollars, and  
 $w$  = total amount of water used, in  $\text{m}^3$ .

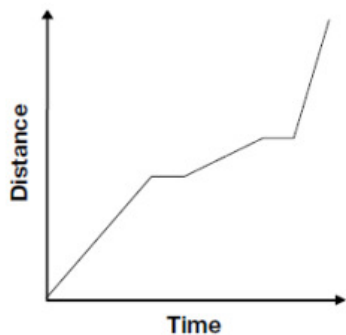


Which equation represents the relationship between  $C$  and  $w$ ?

- F  $C = 4.49 \times 0.86w$   
 G  $C = 4.49w + 0.86$   
 H  $C = 4.49 + 0.86w$   
 J  $C = (4.49 + 0.86)w$

- 2 The graph below shows a runner's **distance** from the starting point of a race over time.

Distance vs. Time

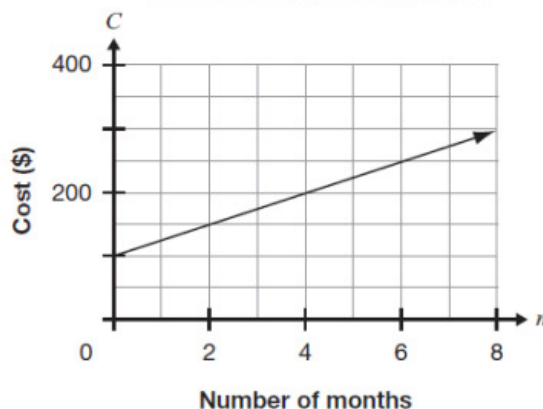


The runner

- a ran at 2 different speeds and took 3 breaks.  
 b ran at 3 different speeds and took 2 breaks.  
 c always ran at the same speed and took 2 breaks.  
 d ran at 5 different speeds.

- 3 The graph below represents the cost to belong to a local gym.

Cost vs. Number of Months

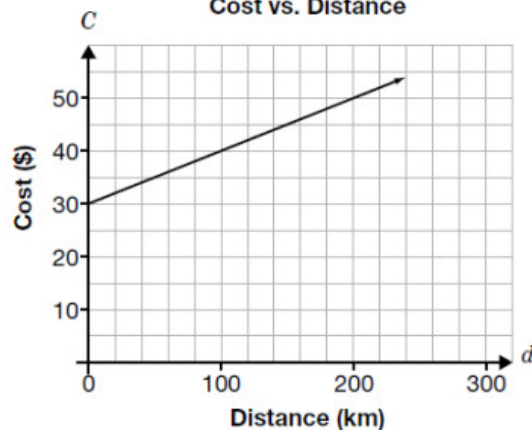


Which equation represents the graph?

- a  $C = \frac{1}{25}n + 100$   
 b  $C = \frac{1}{2}n + 100$   
 c  $C = 2n + 100$   
 d  $C = 25n + 100$

- 4 Which equation represents the line on the graph?

Cost vs. Distance



- a  $C = 0.1d + 30$   
 b  $C = 0.4d + 30$   
 c  $C = d + 30$   
 d  $C = 10d + 30$

5

The student council sells lollipops for 10¢ each. They pay 4¢ for each lollipop and spend \$10 to advertise the sale.



$P$  represents the student council's profit, in dollars, and  $n$  represents the number of lollipops sold.

Which **equation** represents the profit?

- a  $P = 0.06n - 10$
- b  $P = 0.06n + 10$
- c  $P = 10n + 0.06$
- d  $P = 10 + 0.04n$

6

Nadia lives 11.4 km from school and rides her bike to school every day.

The equation  $d = 11.4 - 0.6t$  represents the relationship between  $d$ , her distance from school in km, and  $t$ , her time spent travelling in minutes.

If she leaves home at 8:05 a.m., what time will she get to school?

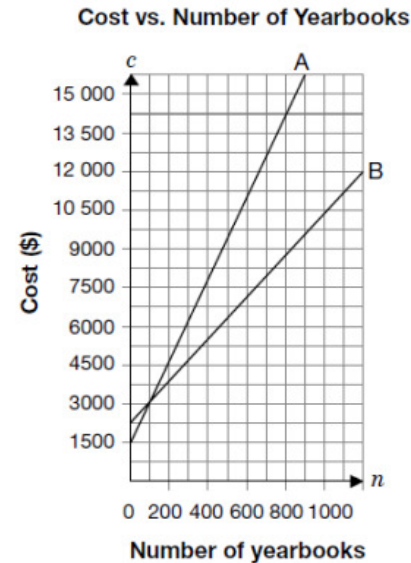
- a 8:11 a.m.
- b 8:16 a.m.
- c 8:17 a.m.
- d 8:24 a.m.

7

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**.



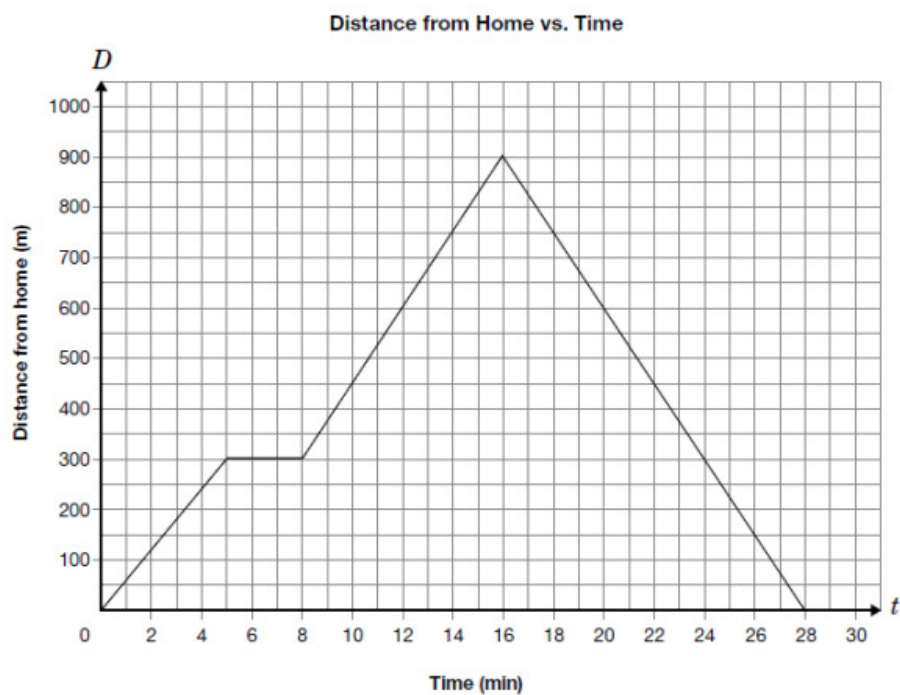
Which statement is **true**?

- 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.

8

**Selena's Stroll**

The graph below represents 4 segments of Selena's morning walk.



Describe the four segments of Selena's walk.

**Hint**

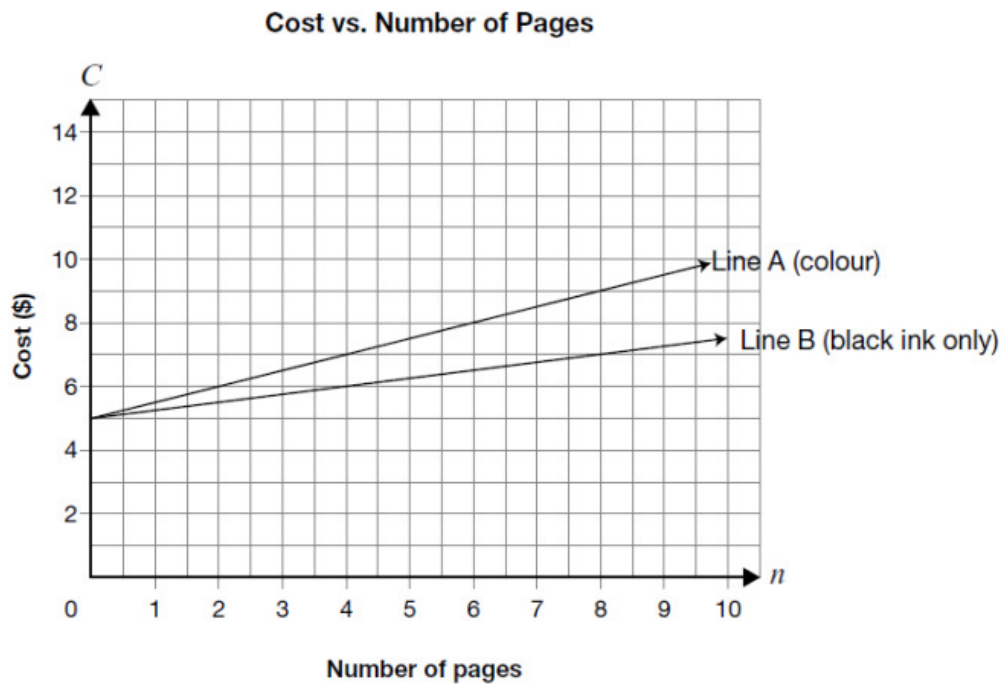
Include information about

- direction,
- distance,
- time and
- speed, in m/min.

9

## To Colour or Not to Colour

The graph below shows the cost to print a document at the Graphics Shop. Line A represents the cost of printing the document in colour. Line B represents the cost to print it with black ink only.



For a 500 page document, how much more will it cost to print in colour than with black ink only?

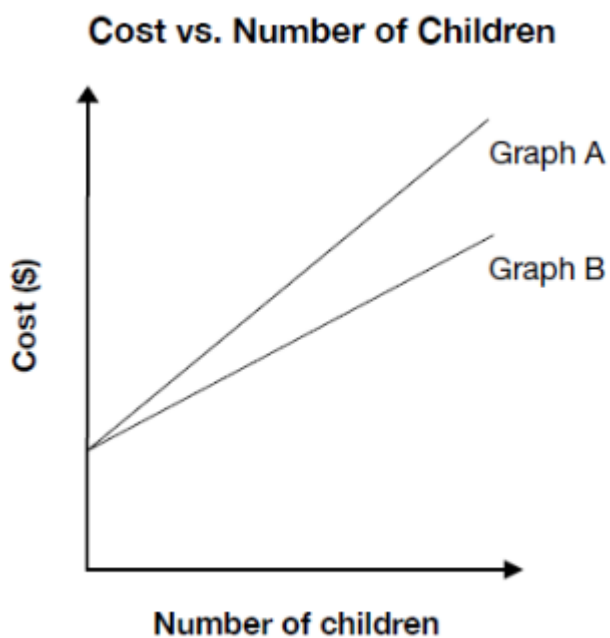
Show your work.

**10 Zoo Trip**

Amina is going to take some children to the zoo or the museum.

The following equations represent the total cost of each trip, where  $C$  is the total cost, in dollars, and  $n$  is the number of children.

A trip to the zoo	$C = 5n + 8$
A trip to the museum	$C = 4n + 8$



Which graph represents the total cost of a trip to the **zoo**?

**Circle one:** Graph A or Graph B

**Give reasons for your choice.**

11

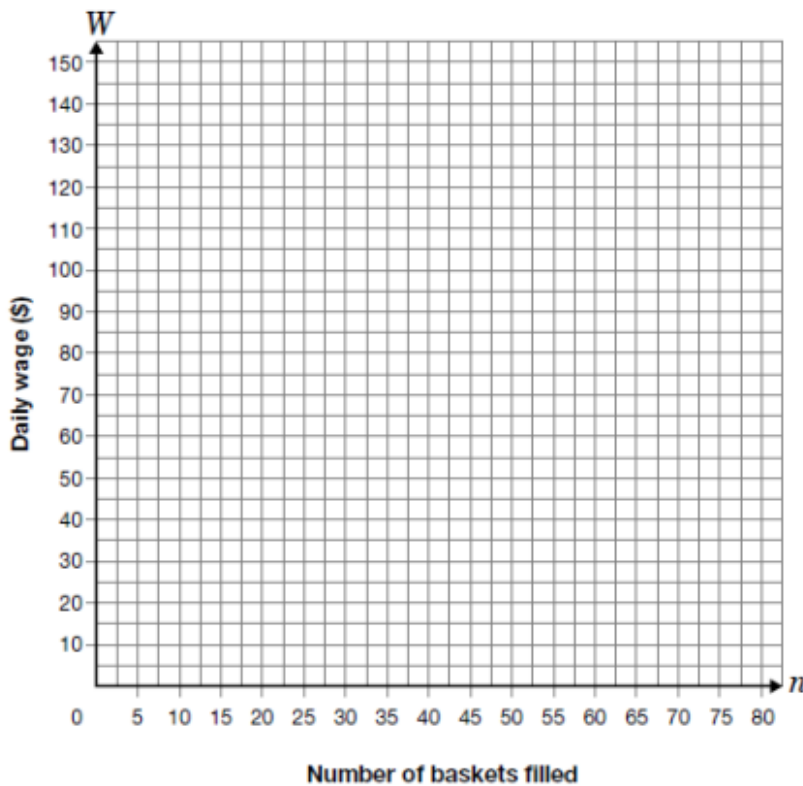
## Berries for Picking



Sanya has a summer job picking berries at a farm. Each day, she is paid a base salary, plus an amount for each basket she fills with berries.

The equation  $W = 15 + 1.25n$  represents the relationship between Sanya's **daily wage**,  $W$ , in dollars, and **the number of baskets** that she fills,  $n$ .

Graph the relationship represented by the equation on the grid below.

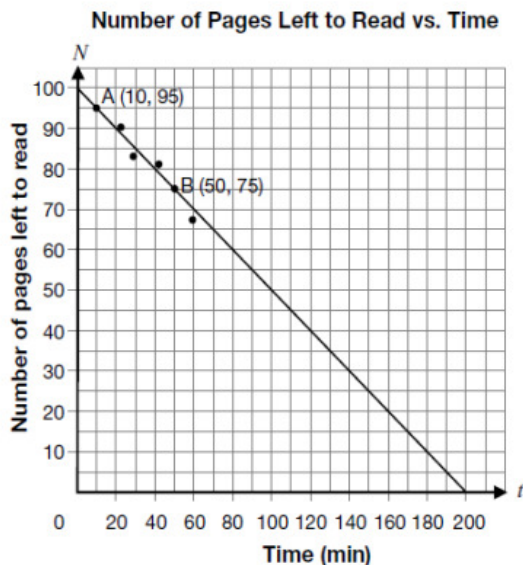


Determine the **number of baskets** that Sanya must fill to have a daily wage of **\$70**. Show your work.



12

The following scatter plot shows the relationship between  $N$ , the number of pages in Annie's textbook that she has left to read, and  $t$ , the time in minutes she spends reading the book.



Which equation represents the line above?

- A  $N = -\frac{1}{2}t + 100$
- B  $N = -\frac{1}{2}t + 200$
- C  $N = -t + 100$
- D  $N = -t + 200$

13

Alex's Rose Shop makes up bouquets and charges for the vase, plus a cost per rose.

- The shop charges \$32.85 for a bouquet of 12 roses.
- The shop charges \$50.85 for a bouquet of 20 roses.

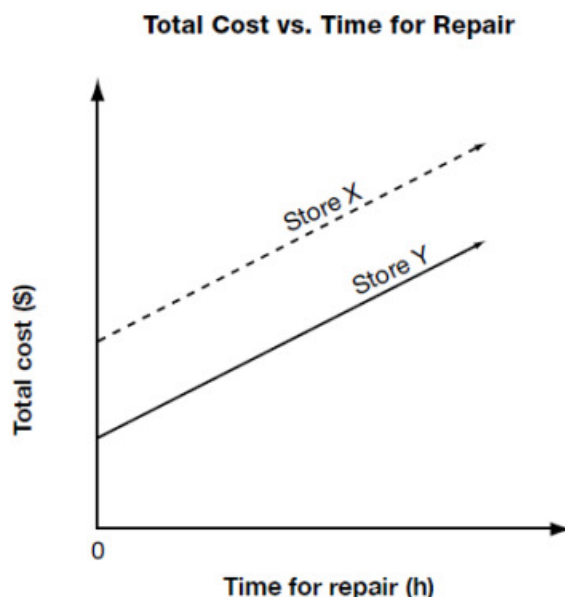
What does Alex's Rose Shop charge for a vase?

- A \$18.00
- B \$8.00
- C \$5.85
- D \$2.74

14

Two bicycle repair stores charge an initial fee and an hourly rate for repairs.

The graph below shows the total cost of repairs versus time for the repair.



Which statement is **true**?

- F The two stores charge different hourly rates and the same initial fee.
- G The two stores charge the same hourly rate and different initial fees.
- H The two stores charge different hourly rates and different initial fees.
- J The two stores charge the same hourly rate and the same initial fee.



15

Victoria is selling chocolate bars to raise money for her hockey team. She begins with 36 bars to sell and sells four bars per day.

Which of the following represents the relation between  $N$ , the number of chocolate bars remaining, and  $d$ , the number of days she has been selling?

a  $N = 36 + 4d$

b  $N = 36d - 4$

c

Day, $d$	Number of bars remaining, $N$
0	20
1	24
2	28
3	32
4	36

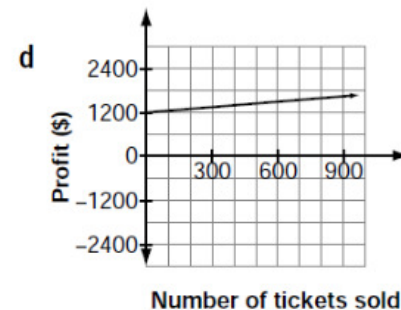
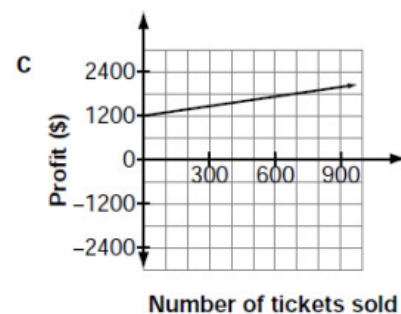
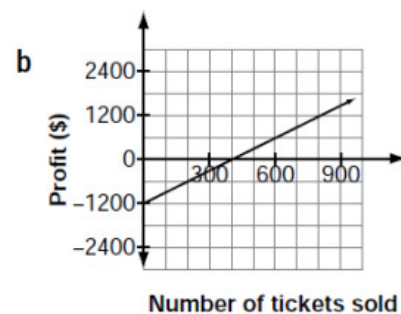
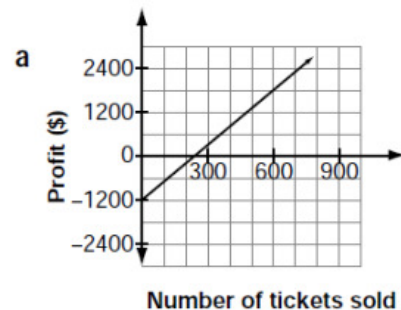
d

Day, $d$	Number of bars remaining, $N$
0	36
1	32
2	28
3	24
4	20

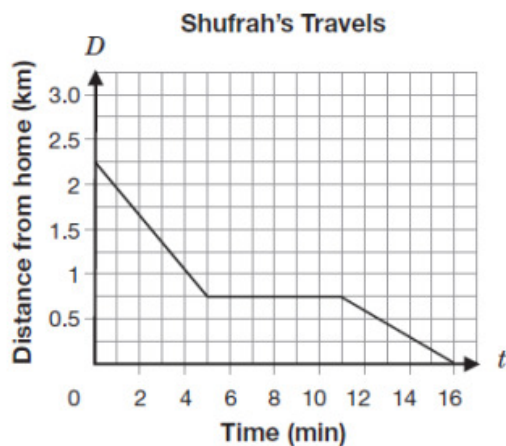
16

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?



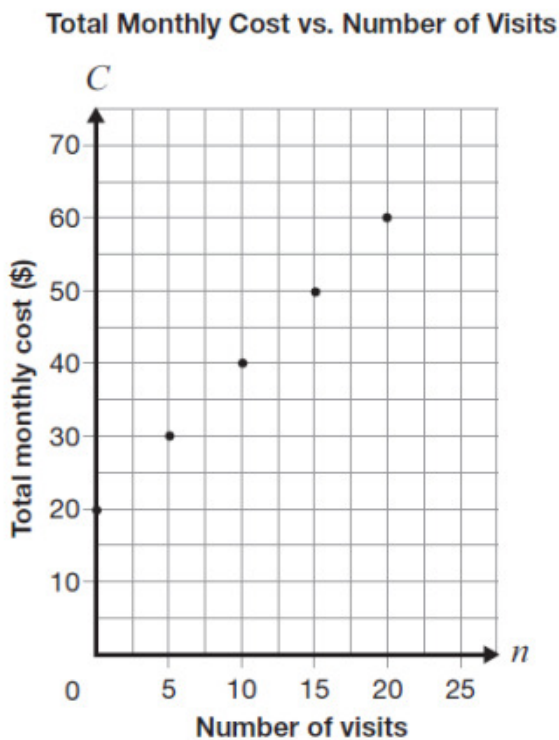
- 17 The relationship between  $t$ , the number of minutes Shufrah travels, and  $D$ , the distance she is from home, is shown on the grid below.



Which of the following statements best describes the way Shufrah travels?

- a While travelling toward her home, Shufrah rides her bike, stops and then walks.
- b While travelling toward her home, Shufrah rides her bike, walks and then rides her bike.
- c While travelling away from home, Shufrah rides her bike, stops and then walks.
- d While travelling away from home, Shufrah walks, rides her bike and then walks.

- 18 Tyler belongs to a fitness club at the community centre. The graph below represents the relationship between the number of times he visits the club and his total monthly cost.



What type of variation is this relationship, and what is the initial value?

- a Direct variation, and initial value is 0
- b Partial variation, and initial value is 0
- c Direct variation, and initial value is 20
- d Partial variation, and initial value is 20

**Answers**

- 1] H
- 2] B
- 3] D
- 4] A
- 5] A
- 6] D
- 7] D
- 8] Walked 300 m forward at 60 m/min for 5 min. Stopped for 3 min.
- 9] Walked 600 m forward at 75 m/min for 8 min. Walked 900 m back home at 75 m/min for 12 min.
- 10] \$125 more
- 11] Graph A
- 12] A
- 13] C
- 14] G
- 15] D
- 16] A
- 17] A
- 18] D

# Student Answer Sheet: Academic

- Enter your multiple-choice answers on this sheet
- To indicate your answer, use an HB pencil to fill in the circle completely, as shown below:

Like this: ● Not like this: ⊗ √ ⊘ ⊙

- If you fill in more than one answer to a question, the question will be scored incorrect.
- Cleanly erase any answer you wish to change and fill in the circle for your new answer.

1. (f) (g) (h) (j)
2. (a) (b) (c) (d)
3. (a) (b) (c) (d)
4. (a) (b) (c) (d)
5. (a) (b) (c) (d)
6. (a) (b) (c) (d)

7. (a) (b) (c) (d)
8. Respond in booklet.
9. Respond in booklet.
10. Respond in booklet.
11. Respond in booklet.
12. (a) (b) (c) (d)

13. (a) (b) (c) (d)
14. (f) (g) (h) (j)
15. (a) (b) (c) (d)
16. (a) (b) (c) (d)
17. (a) (b) (c) (d)
18. (a) (b) (c) (d)

Print Student Name: \_\_\_\_\_

Student Signature: \_\_\_\_\_