

GRADE 9 APPLIED MATH

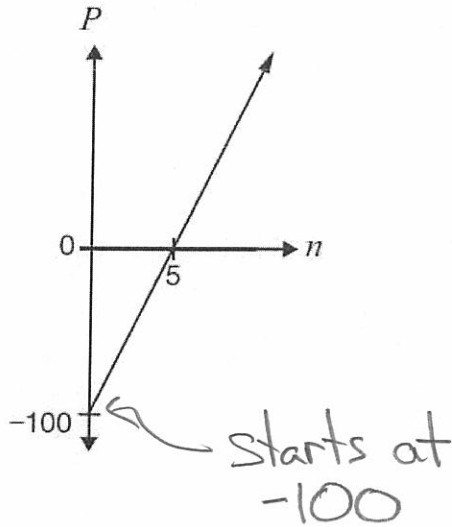
UNIT 1

PRACTICE TEST QUESTIONS



SOLUTIONS

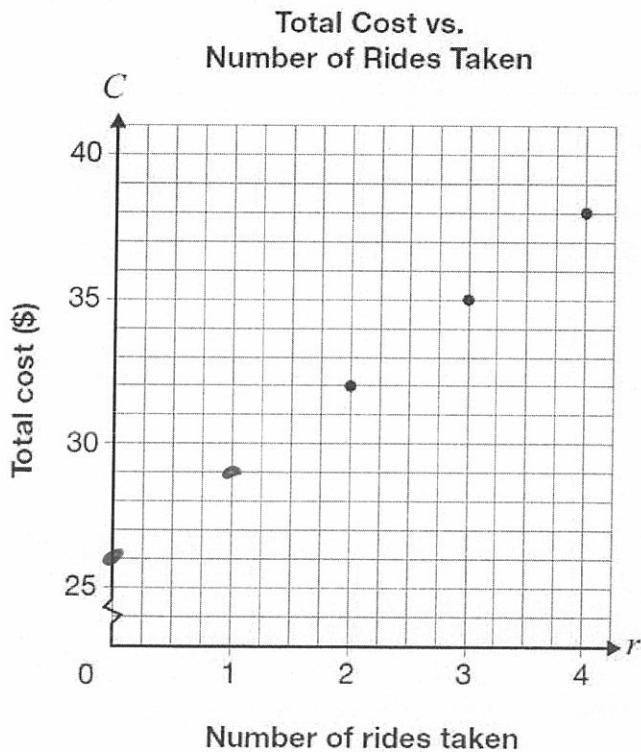
- 1) Joel has a summer job cutting lawns. The relationship between his profit, P , in dollars, and the number of lawns cut, n , is shown by the graph below.



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

- a a direct variation with an initial value of \$5
- b a direct variation with an initial value of -\$100
- c a partial variation with an initial value of \$5
- d a partial variation with an initial value of -\$100

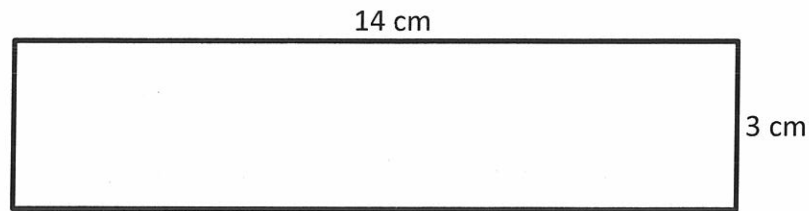
- 2) The graph below represents information about the linear relationship between the total cost of a day at the fair and the number of rides taken.



Which of the following equations represents the relationship between C and r ?

- a $C = 3r$
 - b $C = 9.5r$
 - c $C = 0.75r + 26$
 - d $C = 3r + 26$
- rate start value

3) Determine the perimeter and area of the following rectangle.



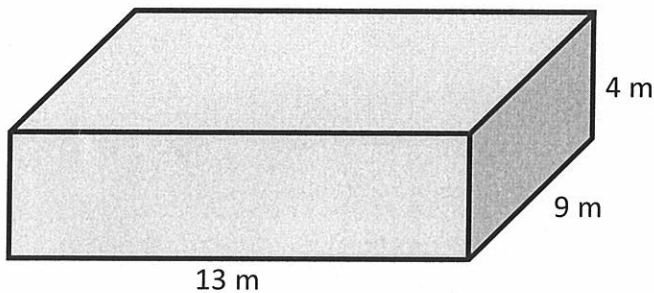
Perimeter

$$\begin{aligned} P &= 14 + 3 + 14 + 3 \\ &= \underline{\underline{34 \text{ cm}}} \end{aligned}$$

Area

$$\begin{aligned} A &= lw \\ &= (14)(3) \\ &= \underline{\underline{42 \text{ cm}^2}} \end{aligned}$$

4) Determine the volume of the following rectangular prism.



$$\begin{aligned} V &= lwh \\ &= (13)(9)(4) \\ &= \underline{\underline{468 \text{ m}^3}} \end{aligned}$$

5) A computer has a price of \$899.

a) How much HST (13%) will be charged?

$$13 \div 100 = 0.13$$

$$\begin{aligned} \text{Tax} &= 899 \times 0.13 \\ &= \underline{\underline{\$116.87}} \end{aligned}$$

b) What is the total cost of the computer?

$$\begin{aligned} &899 + 116.87 \\ &= \underline{\underline{\$1015.87}} \end{aligned}$$

- 6) Rachel starts with \$250 in her bank account and deposits (adds) \$40 each week.
 a) Choose an appropriate letter to represent the amount of money in Rachel's account.

A

- b) Choose an appropriate letter to represent the number of weeks. w

- c) Create an equation to model the relationship.

Equation: $A = 250 + 40w$

- d) Is this situation an example of **direct variation** or **partial variation**. Explain your answer.

Partial variation, since the start value is 250 (not 0).

- e) Use your equation to find the amount of money in the account after 15 weeks.

$$\begin{aligned} A &= 250 + 40w \\ A &= 250 + 40(15) \\ A &= 250 + 600 \\ A &= \underline{\underline{\$850}} \end{aligned}$$

- 7) Two stores are selling iPods. **Best Buy** sells the iPod for \$299 with 20% off. **The Source** sells the iPod for \$279 with 10% off.

- a) Find the cost of the iPod at each store, **including tax** (13% HST).

BEST BUY

$$20 \div 100 = 0.2$$

$$\begin{aligned} \text{Discount} &= 299 \times 0.2 \\ &= 59.80 \end{aligned}$$

$$\begin{aligned} \text{New price} &= 299 - 59.80 \\ &= 239.20 \end{aligned}$$

$$13 \div 100 = 0.13$$

$$\begin{aligned} \text{Tax} &= 239.20 \times 0.13 \\ &= 31.10 \end{aligned}$$

$$\begin{aligned} \text{Total} &= 239.20 + 31.10 \\ &= \underline{\underline{\$270.30}} \end{aligned}$$

THE SOURCE

$$10 \div 100 = 0.1$$

$$\begin{aligned} \text{Discount} &= 279 \times 0.1 \\ &= 27.90 \end{aligned}$$

$$\begin{aligned} \text{New price} &= 279 - 27.90 \\ &= 251.10 \end{aligned}$$

$$13 \div 100 = 0.13$$

$$\begin{aligned} \text{Tax} &= 251.10 \times 0.13 \\ &= 32.64 \end{aligned}$$

$$\begin{aligned} \text{Total} &= 251.10 + 32.64 \\ &= \underline{\underline{\$283.74}} \end{aligned}$$

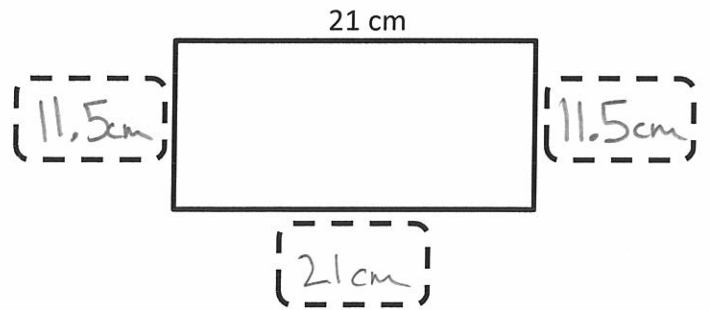
- b) Which store is offering a better deal?

Best Buy

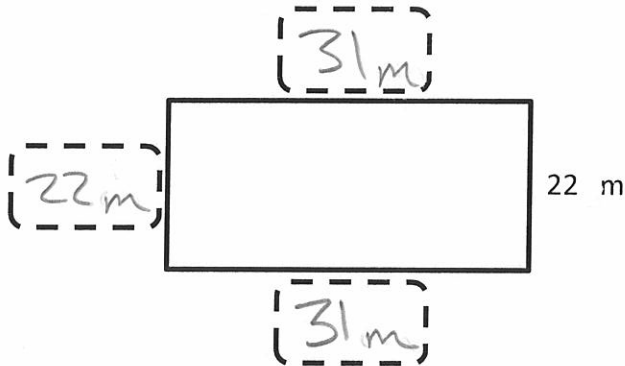
8) The following rectangle has a **perimeter** of 65 cm. Determine the lengths of its sides.

$$65 - 21 - 21 = 23$$

$$23 \div 2 = 11.5$$

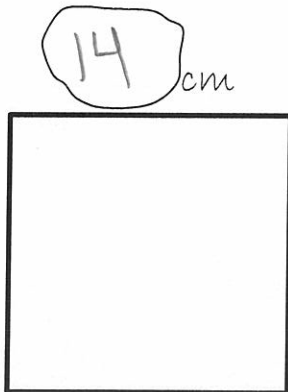


9) The following rectangle has an area of 682 m². Find the lengths of its sides.



$$682 \div 22 = 31$$

10) Marco was finding the perimeter and area of the following **square**, when he accidentally spilled ketchup on his work. Fill in each ketchup spot with the correct values.



$$\text{Perimeter} = \underline{56 \text{ cm}}$$

$$\text{Area} = \underline{196 \text{ cm}^2}$$

$$\text{Side length} = 56 \div 4$$

$$\begin{aligned} A &= lw \\ &= (14)(14) \\ &= 196 \text{ cm}^2 \end{aligned}$$

11) Paul was working with a square that has an area of 100 m². To find how long each side is, he did the following calculation:

$$\text{Side length} = 100 \div 4$$

$$= 25$$

Therefore, each side is 25 m long.

Is Paul correct? Explain.

Paul is not correct. He is treating the 100m² as a perimeter instead of an area.

12) Determine an equation to represent each of the following relations.

a)

Number of Minutes	Distance from Home (m)
0	50
1	160
2	270
3	380
4	490

Handwritten notes: m above first column, d above second column. Arrows on the right indicate a constant increase of $+110$ in distance for each unit increase in minutes.

Equation: $d = 50 + 110m$

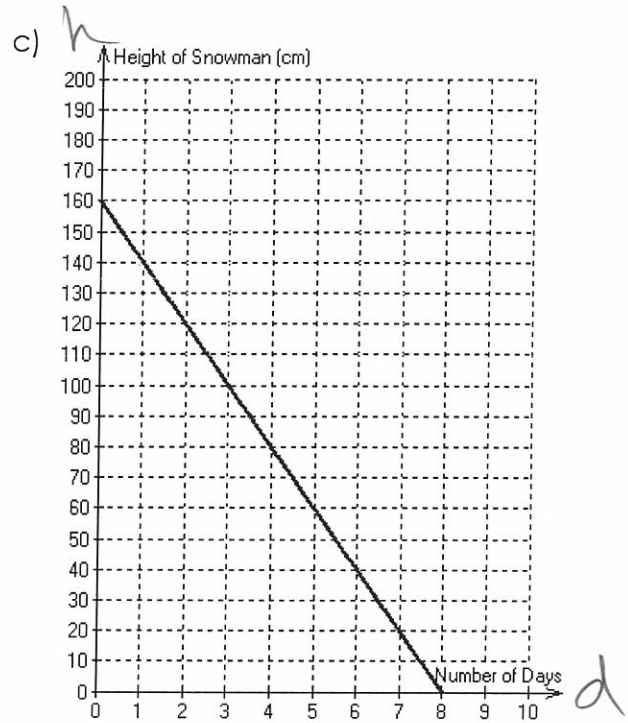
b)

Number of Kilometers Driven	Total Cost (\$)
0	5
20	85
40	165
60	245
80	325

Handwritten notes: k above first column, c above second column. Arrows on the right indicate a constant increase of $+80$ in total cost for every 20 kilometers driven.

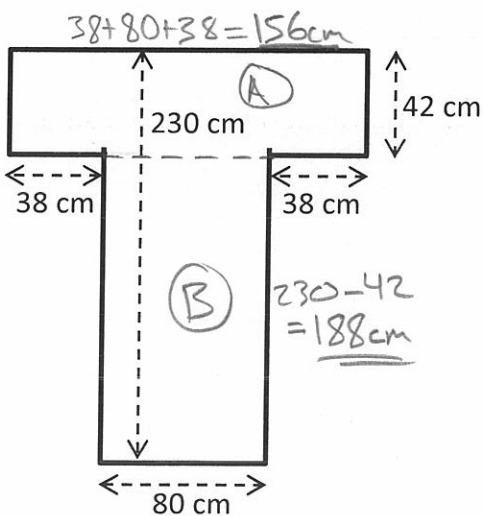
Equation: $c = 5 + 4k$

Handwritten note: $80 \div 20 = 4$ with an arrow pointing to the coefficient 4 in the equation.



Equation: $h = 160 - 20d$

13) Raphael is painting sign. The letter "T" on the sign is shown below. Determine the area of the letter's face.



(A)

$$A = lw$$

$$= (156)(42)$$

$$= 6552 \text{ cm}^2$$

(B)

$$A = lw$$

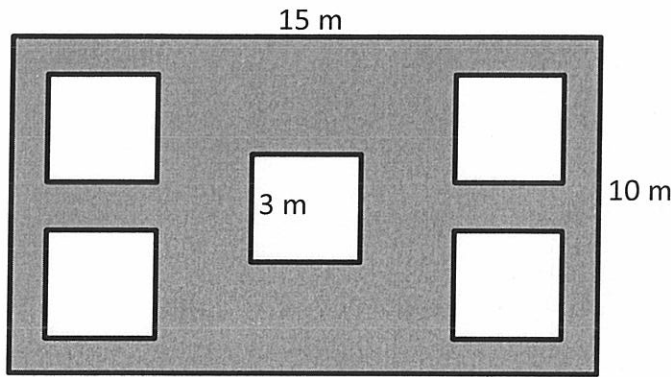
$$= (188)(80)$$

$$= 15040 \text{ cm}^2$$

Total area = $6552 + 15040$

$$= \underline{\underline{21592 \text{ cm}^2}}$$

- 14) Five squares are removed from the rectangle shown below. Find the area of the shaded region that remains.



Large Rectangle

$$A = lw \\ = (15)(10) \\ = 150m^2$$

Square

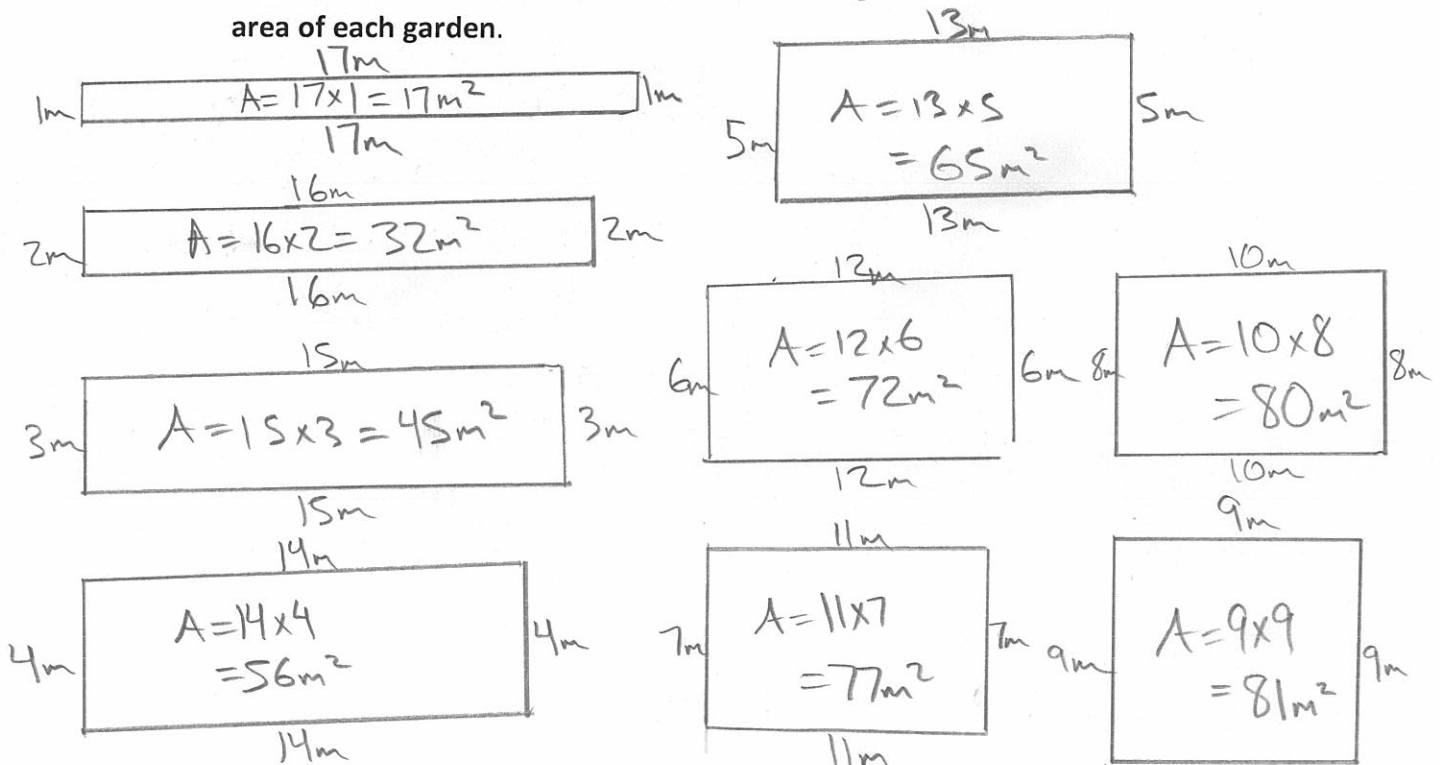
$$A = lw \\ = (3)(3) \\ = 9m^2$$

$$\text{Five Squares} = 9 \times 5 \\ = 45m^2$$

$$\text{Shaded area} = 150 - 45 = \boxed{105m^2}$$

- 15) Michelle is constructing a rectangular garden. She has 36 m of fence to enclose the garden.

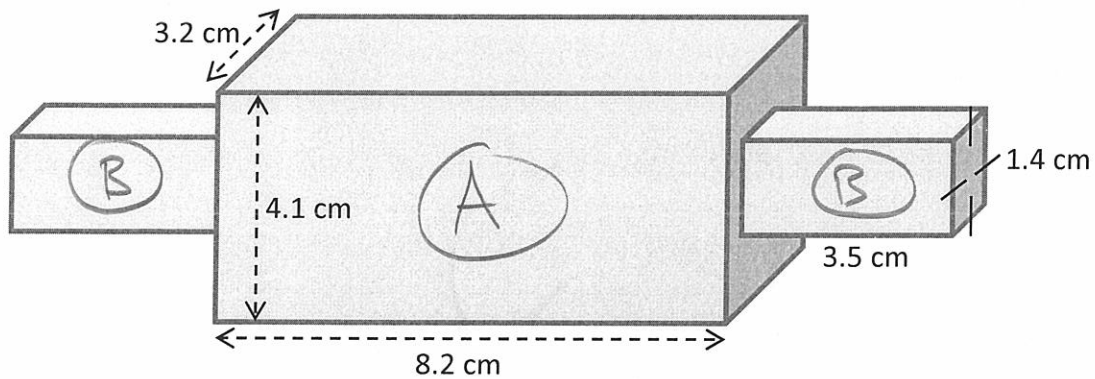
- a) Draw as many gardens as possible without using decimal values and calculate the area of each garden.



- b) If Michelle wants to construct the largest garden possible, what length and width should she choose?

She should choose a length of 9m and a width of 9m (a square) since it will give the largest area.

- 16) A machine part consists of a rectangular prism with identical smaller rectangular prisms on the ends, as shown below. Determine the total volume of the machine part.



$$\begin{aligned} \textcircled{A} \quad V &= lwh \\ &= (8.2)(3.2)(4.1) \\ &= 107.584 \text{ cm}^3 \end{aligned}$$

$$\begin{aligned} \textcircled{B} \quad V &= lwh \\ &= (3.5)(1.4)(1.4) \\ &= 6.86 \text{ cm}^3 \end{aligned}$$

$$\begin{aligned} \text{Total Volume} &= 107.584 + 6.86 + 6.86 \\ &= 121.304 \text{ cm}^3 \end{aligned}$$
