

Practice Test

All Topics

Year 8 Mathematics

Topics Included:

- Algebra
- Geometry
- Rates and Ratios
- Triangle Geometry and Angles
- Statistics and Data
- Time and Distance Graphs

Name:



VERTEX
MATHEMATICS

Section I

10 marks

Attempt Questions 1–10

Allow about 15 minutes for this section

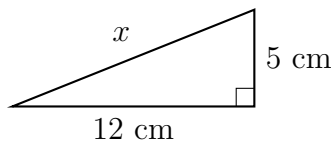
1 Simplify the expression: $4a^2b \times 3a^3b^4$.

- (A) $12a^6b^4$ (B) $7a^5b^5$ (C) $12a^5b^5$ (D) $12a^6b^5$

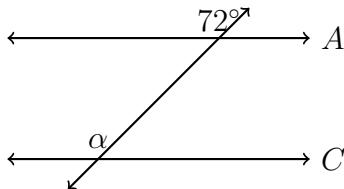
2 Solve for x : $\frac{2x - 5}{3} = 7$.

- (A) $x = 8$ (B) $x = 13$ (C) $x = 10$ (D) $x = 11$

3 Find the value of x in the right-angled triangle below:



4 In the diagram below, lines AB and CD are parallel. Find the value of α :



- (A) 108° (B) 72° (C) 18° (D) 82°

5 A car travels 240 km in 3 hours and 20 minutes. What is its average speed in km/h?

- (A) 80 km/h (B) 72 km/h (C) 75 km/h (D) 68 km/h

6 Triangle ABC is congruent to Triangle PQR . If $\angle A = 40^\circ$ and $\angle B = 85^\circ$, what is the size of $\angle R$?

- (A) 40° (B) 85° (C) 55° (D) 65°

7 The mean of five numbers is 12. If a sixth number, x , is added, the new mean becomes 15. What is the value of x ?

(A) 30

(B) 15

(C) 27

(D) 18

8 Solve for x : $3(x + 4) = 5x - 2$.

(A) $x = 7$ (B) $x = 1$ (C) $x = 5$ (D) $x = 14$

9 In a stem-and-leaf plot row, the stem is 3 and the leaves are 1, 1, 5, 8. What is the range of this specific data row?

(A) 7

(B) 38

(C) 31

(D) 4

10 A map has a scale of 1 : 250,000. If two towns are 8 cm apart on the map, what is the actual distance in kilometres?

(A) 2 km

(B) 20 km

(C) 200 km

(D) 2,000 km

Section II

51 marks

Attempt Questions 11–20

Allow about 75 minutes for this section

Answer each question. Show all relevant mathematical reasoning.

Question 11 (6 marks)

(a) Consider the expression $7xy + 3x - 5y^2 + 8$. State:

(i) The coefficient of x .

1

(ii) The constant term.

1

(b) Simplify the following algebraic expressions by collecting like terms:

(i) $5x + 4y - 2x + 7y$

1

(ii) $8x - 3x^2 + 4x^2 + x$

1

(c) Simplify the following using index laws, leaving your answer in index form:

(i) $\frac{10a^7 \times 2a^3}{4a^5}$

2

Question 12 (8 marks)

(a) Over a 10-week term, a student was present for 42 days out of a total of 50 school days. Write the following ratios in simplest form:

(i) The ratio of days absent to total school days.

1

(ii) The ratio of days present to days absent.

1

(iii) In a particular week, the ratio of time spent on homework to time spent on sport was 2 : 3. If the student spent 6 hours on homework, how many hours did they spend on sport?

2

(b) Solve the following rate and proportion problems:

(i) A saltwater aquarium requires 35 g of salt for every 1,000 mL of water. If a tank holds 120 L of water, how many kilograms of salt are required?

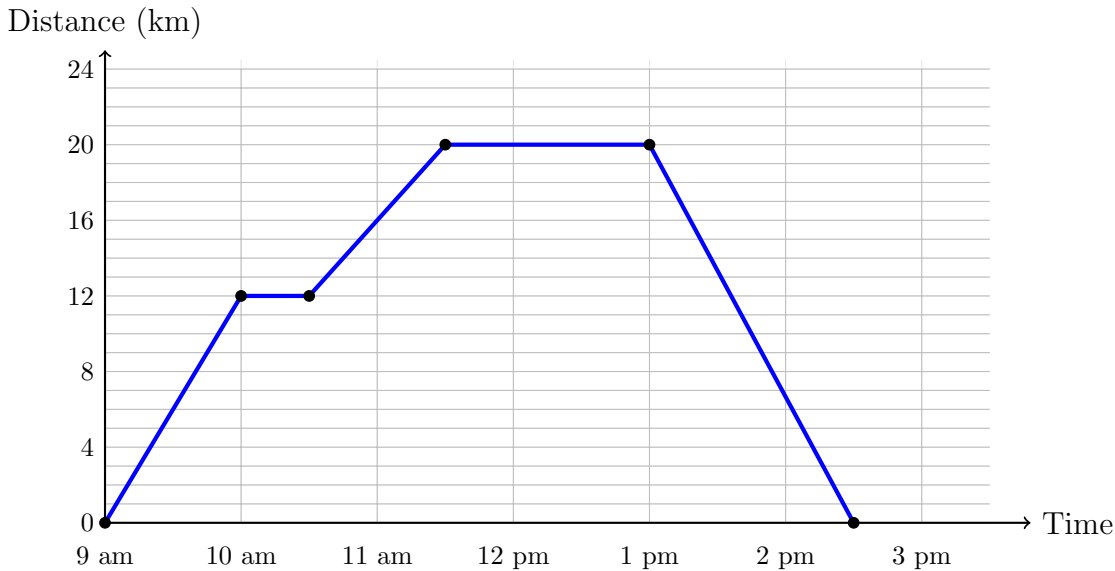
2

(ii) At a construction site, there is enough water for 12 workers to last 10 days. How long would the water last if there were 15 workers?

2

Question 13 (8 marks)

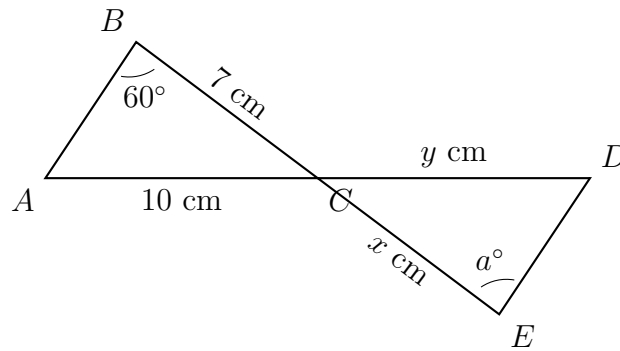
A cyclist, Sarah, leaves home to visit a library. On the way, she stops at a cafe. After spending time at the library, she cycles straight back home. Her journey is shown on the distance-time graph below.



- | | |
|---|---|
| (a) At what time did Sarah arrive at the cafe (her first stop)? | 1 |
| (b) Calculate Sarah's speed, in km/h, between her home and the cafe. | 1 |
| (c) How long did Sarah stay at the library? | 1 |
| (d) At what time was Sarah 16 km from home on her way to the library? | 1 |
| (e) Calculate Sarah's speed, in km/h, when she was returning home from the library. | 2 |
| (f) What was the total time that Sarah was stopped during her journey? | 1 |
| (g) Calculate Sarah's average speed for the entire journey, correct to one decimal place. | 1 |

Question 14 (7 marks)

In the diagram below, $\triangle ABC \cong \triangle DEC$. This means the triangles are exactly the same size and shape. Find the values of the pronumerals x, y , and a , providing a brief reason for each.



- (i) Find the value of y . 2
- (ii) Find the value of x . 2
- (iii) Find the value of a . 3

Question 15 (7 marks)

- (a) A rectangle has length $(x + 3)$ and width x . Its area is 40 m^2 . Find x . 4
- (b) Solve for x : $\frac{x+2}{3} - \frac{x-1}{4} = 2$. 3

Question 16 (6 marks)

A basketball player recorded the number of three-point shots they made per game over a season. The results are presented in the frequency table below.

Number of shots	0	1	2	3	4	5
Number of games	2	5	4	6	2	1

- (a) How many games did the player play in total during the season? 1
- (b) What is the mode (the most common number of shots made)? 1
- (c) Find the range of the number of shots made. 1
- (d) Calculate the mean number of shots made per game. Show your working. 3

Question 17 (6 marks)

This back-to-back stem-and-leaf plot shows the daily sales (in dollars) of two different juice bars, “Squeeze It” and “Fresh Stop,” over a two-week period.

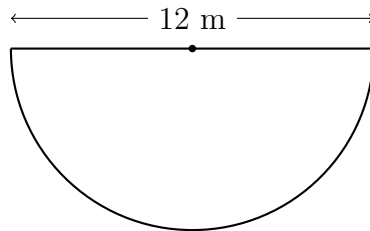
Squeeze It	Stem	Fresh Stop
8	4	6 7
7 7 5 3	5	4 5
	6	1
2	7	5

Key: 4 | 8 in Squeeze It represents \$48.

- | | |
|---|----------|
| (a) Which shop had a day where they earned exactly \$61? | 1 |
| (b) How many days of sales were recorded for Squeeze It? | 1 |
| (c) Find the range of daily sales for Fresh Stop. | 2 |
| (d) One shop claims to have more “consistent” sales because their scores are clustered closer together. By comparing the range of both shops, determine which shop has the more consistent sales. | 2 |

Question 17 (3 marks)

The diagram below shows a semicircle with a diameter of 12 m.



Calculate the area of this semicircle, correct to two decimal places. Show all your working.	3
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END OF EXAM

Nice work completing the test :)

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