



CONVENT OF THE HOLY INFANT JESUS SECONDARY

SECONDARY 1 EXPRESS

MATHEMATICS

Term 2 Weighted Assessment 2021

Week 8, May 2021



45 minutes

Redacted for student privacy

Name

Class: Sec 1

Answer all questions and show all your working clearly in the spaces provided.
Omission of working will result in loss of marks.

- 1 In 2019, the population of Singapore was approximately 5 704 000.
This value has been rounded to 4 significant figures.
Write down the greatest possible number for the population.

Answer 5 704 499 [1]

- 2 If $a = -3$, $b = 4$ and $c = -1$, evaluate $a + \sqrt{b^3 + 17c^2}$.

$$(-3) + \sqrt{(4)^3 + 17(-1)^2} = 6$$

Answer 6 [1]

- 3 Without the use of a calculator, estimate the value of $\sqrt{401} - 5.01^2 + 3.89^3$.
Correct your answer to 1 significant figure.

$$\begin{aligned} \sqrt{400} - 5^2 + 3.9^3 &= 20 - 25 + 59.319 \\ &= 54.319 \\ &= 50 \text{ (to 1sf)} \end{aligned}$$

$$\begin{aligned} \sqrt{401} - 5.01^2 + 3.89^3 \\ \approx \sqrt{400} - 5^2 + 4^3 \\ = 20 - 25 + 64 \\ = 59 \\ = 60 \text{ (1sf)} \end{aligned}$$

Answer 50 [2]

4 Simplify the following expressions. Leave your answer in the factorized form where possible.

(a) $\frac{64x^3b}{4ab^2} = \frac{16x^3b}{ab^2} = \frac{16x^3 \cancel{b} \cancel{a} \cancel{a} \cancel{a} \cancel{b}}{\cancel{a} \cancel{b} \cancel{b}} = \frac{16x^3}{b} = \frac{16x^3}{b}$

Answer $\frac{16x^3}{b}$ [1] ✓

(b) $8p^2q - 5pq^2 + 2pq + 3pq^2$

$= 8p^2q - 5pq^2 + 3pq^2 + 2pq$

$= 8p^2q - 5pq^2 + 3pq^2 + 2pq$

$= 8p^2q - 2pq^2 + 2pq$

$= 8p^2q - 2pq^2 + 2pq$

$= 2pq(4p - q + 1)$

$= 2pq(4p - q + 1)$

Answer $2pq(4p - q + 1)$ [2] ✓

(c) $5m - 2n[11p - 3(7p - m)]$

$= 5m - 2n(11p - 21p - 3m)$

$= 5m - 2n(11p - 21p - 3m)$

$= 5m - 2n(-10p - 3m)$

$= 5m - 2n(-10p - 3m)$

$= 5m + 20pn + 6mn$

$= 5m + 20pn + 6mn$

$= 11m - 14n - 20p$

Answer $5m + 20pn + 6mn$ [2] ✓

5 Solve the following equations.

(a) $\frac{1}{4}h - 2 = \frac{h}{5}$

$\frac{h}{4} - \frac{2 \times 4}{1 \times 4} = \frac{h}{5}$

$\frac{h-8}{4} = \frac{h}{5}$

$5(h-8) = 4h$

$5h - 40 = 4h$

$5h - 4h = 40$

$h = 40$

Answer 40 [2] ✓

$$(b) \quad \frac{1}{3m+2} + \frac{9}{11} = \frac{1}{1}$$

$$\frac{11(1)}{11(3m+2)} + \frac{9(3m+2)}{11(3m+2)} = \frac{1}{1}$$

$$\frac{11}{33m+22} + \frac{27m+18}{33m+22} = \frac{1}{1}$$

$$\frac{27m+18}{33m+22} = \frac{1}{1}$$

$$27m+18 = 33m+22$$

$$27m-33m = 22-18$$

$$-6m = 4$$

$$-m = -\frac{4}{6}$$

$$-m = -\frac{2}{3}$$

$$m = \frac{2}{3}$$

$$\frac{1}{3m+2} = 1 - \frac{9}{11}$$

$$\frac{1}{3m+2} = \frac{2}{11}$$

$$1 \times 11 = 2(3m+2)$$

$$11 = 6m+4$$

$$-6m = 4+11$$

$$-m = -\frac{1}{6}$$

$$m = \frac{1}{6}$$

Answer ~~$\frac{2}{3}$~~ $\frac{1}{6}$ [2] |

$$(c) \quad \frac{19}{15} = \frac{2p+13}{3(2p-1)}$$

$$\frac{19}{15} = \frac{2p+13}{6p-3}$$

$$19(6p-3) = 15(2p+13)$$

$$114p-57 = 30p+195$$

$$114p-30p = 195+57$$

$$84p = 252$$

$$p = \frac{252}{84}$$

$$p = 3$$

Answer ~~3~~ [2] 2

6

Express as a single fraction.

$$\frac{y-4}{5} - \frac{3y-7}{2} + \frac{4}{1}$$

$$= \frac{2(y-4)}{10} - \frac{5(3y-7)}{10} + \frac{10(4)}{10}$$

$$= \frac{2y-8}{10} - \frac{15y-35}{10} + \frac{40}{10}$$

$$= \frac{2y-15y-8-35+40}{10}$$

$$= \frac{-13y-3}{10}$$

$$= \frac{(y-4) \times 2}{5 \times 2} - \frac{(3y-7) \times 5}{2 \times 5} + \frac{4 \times 10}{10}$$

$$= \frac{2y-8}{10} - \frac{15y-35}{10} + \frac{40}{10}$$

$$= \frac{2y-8-15y-35+40}{10}$$

$$= \frac{-13y+67}{10}$$

$$\frac{-13y+67}{10}$$

Answer $\frac{-13y-3}{10}$ [3]

7

Company Q produced two sizes of mineral water of the same brand, shown in the diagram.

⑥ $1.25 \times 1000 \text{ ml} = 2.35$

1ml costs $\frac{2.35}{125 \times 1000}$
 $= 0.00188$

Option A

Multi pack



600 ml x 5 bottles
 \$5.70

Option B

Single buy



1.25 litres
 \$2.35

Which one of the options shown is a better value for money?
 Show your working clearly.

$600 \times 5 = 3000 \text{ ml}$

$1.25 \text{ l} = 1250 \text{ ml}$

$2.5 \text{ l} = 2500 \text{ ml}$

$2500 \text{ ml} = \$2.35 \times 2$
 $= \$4.70$

$500 \text{ ml} = \$4.70 \div 5$
 $= \$0.94$

$3000 \text{ ml} = \$0.94 \times 6$
 $= \$5.64$

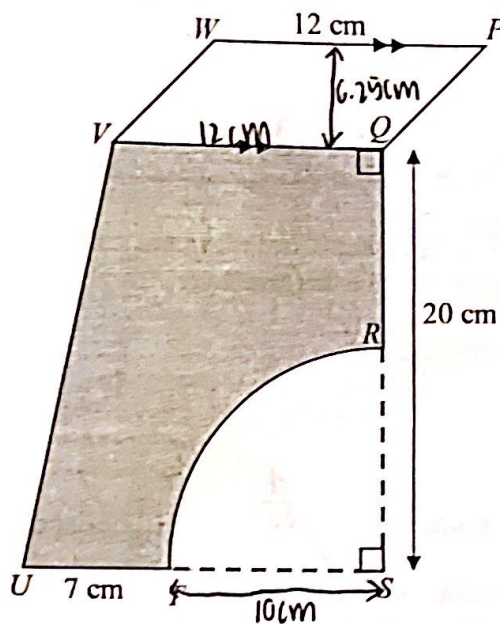
⑦ $5 \times 600 \text{ ml}$ cost \$5.70

1ml costs $\frac{5.70}{5 \times 600}$
 $= 0.0019$

Answer Option B [3]

8
(a)

In the diagram shown, $PQVW$ is a parallelogram with $WP = 12$ cm.
The area of $PQVW$ is 75 cm^2 . Find the perpendicular height from W to the line VQ .



$$\text{length} = 75 \text{ cm}^2 \div 12 \text{ cm} \\ = 6.25 \text{ cm}$$

Answer 6.25 cm [2]

- (b) $VQSU$ is a trapezium with $QS = 20$ cm. $UT = 7$ cm.
A quadrant RST , with centre S and radius 10 cm, has been removed from the trapezium.
Find the area of the shape $VQRTU$. Give your answer correct to the nearest whole number.

$$\begin{aligned} \text{Area of trapezium } VQSU \\ &= \frac{1}{2} \times (12 \text{ cm} + 17 \text{ cm}) \times 20 \text{ cm} \\ &= 290 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of quadrant } RST \\ &= \frac{1}{4} \times \pi \times 10 \text{ cm} \times 10 \text{ cm} \\ &= 25\pi \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of shape } VQRTU \\ &= 290 \text{ cm}^2 - 25\pi \text{ cm}^2 \\ &= 211.46018 \\ &= 211 \text{ (nearest whole number) cm}^2 \end{aligned}$$

Answer 211 cm² [2]

- 9 The distance between Jane's home and office is d km.
She travels at a speed of 48 km/h from her home to the office.
- (a) Write an expression in terms of d for the time taken in hours for this journey.

Jane's home $\xrightarrow{d \text{ km}}$ Office



$$\frac{d}{s} = t \quad \frac{d}{48} = \text{time}$$

Answer $\frac{d}{48}$ hours [1]

- (b) From the office, she returns home increasing her speed by 12 km/h, travelling the same route.
Write an expression in terms of d for the time taken in hours for this journey.

$$48 + 12 = 60 \text{ km/h}$$

$$\frac{d}{s} = t$$

$$\frac{d}{60} \text{ hours}$$

Answer $\frac{d}{60}$ hours [1]

- (c) The difference in time taken for the two journeys is 6 minutes.
Write an equation in terms of d , connecting the two journeys.

$$\frac{d}{60} - \frac{d}{48} = \frac{d}{240} \quad ?$$

$$\frac{d}{48} - \frac{d}{60} = \frac{6}{60}$$

$$\frac{d}{240} = 6 \text{ min}$$

$$\frac{d}{60} + \frac{d}{48} = \frac{3d}{80} \text{ km}$$

$$\frac{3d}{80} \text{ km} \quad \frac{d}{48} - \frac{d}{60} = \frac{6}{60}$$

Answer [1]

- (d) Solve your equation to find the value of d .

$$\frac{d}{240} = 6 \text{ min} \times 40$$

$$= 240 \text{ sec}$$

$$d = 4 \text{ min} \times 240$$

$$= 560 \text{ m}$$

$$= 9\frac{1}{3} \text{ km}$$

$$\frac{1}{240} = \frac{6}{60}$$

$$d = \frac{6}{60} \times \frac{1}{240}$$

$$= 24$$

Answer $d = 9\frac{1}{3} \text{ km}$ [2]

End of paper
All the best