

Word Problem Worksheet
& Solutions
Catholic High Paper 2
P6 Mathematics Prelim 2023

Show your working clearly in the space provided for each question and write your answers in the spaces provided. Questions can be found at the end of the worksheet.

6. Let price of book = p

	Nathan	Mabel	
Amount at first	\$92	\$50	
Bought book	$-p$	$-p$	
Amount left	5	2	
	70	28	(x 14)
Book price = $92 - 70 =$			
			\$22

Ans: \$22

7. $\angle CDG = 360 - 260 - 90 = 10^\circ$
 $\angle GDH = \angle CDA - \angle CDG = 75 - 10 = 65^\circ$
 $\angle FHD = 360 - 90 - 90 - 65 = 115^\circ$

Ans: 115°

8. a)

$$\text{Ratio of Group A 10-km route vs that of Group B} = \frac{90}{360} \times 2 : \frac{20}{100} = 0.5 : 0.2 = 5 : 2$$

b)

$$\text{Participants in Group B} = 150 \div 3 = 50$$

$$\text{Number of people in Group B's 5-km route} = 0.48 \times 50 = 24$$

$$\text{Distance travelled} = 24 \times 5 = 120 \text{ km}$$

$$\text{Number of people in Group B's 10-km route} = 0.2 \times 50 = 10$$

$$\text{Distance travelled} = 10 \times 10 = 100 \text{ km}$$

$$\text{Number of people in Group B's 2-km route} = 50 - 24 - 10 = 16$$

$$\text{Distance travelled} = 16 \times 2 = 32 \text{ km}$$

$$\text{Total distance travelled by Group B} = 120 + 100 + 32 = 252 \text{ km}$$

Ans: a) 5: 2

b) 252 km

9. $\angle AEF = 85 - \angle BFE = 85 - 27 = 58^\circ$

(CEF isosceles, external angle)

$$\angle FAB = \frac{1}{2} \times (180 - 58) = 61^\circ$$

(AEF isosceles)

$$\angle AFB = 180 - 85 - 61 = 34^\circ$$

Ans: 34°

10. Maverick's speed = $3000 \div 24 = 125$ m per min
Difference in Nathan's speed = $825 \div 15 = 55$ m per min
Nathan's speed = $125 + 55 = 180$ m per min

Ans: 180 m per min

11. a)
Day 4
b)
Discounted price for every \$300 = $300 - 50 = \$250$

Number of \$250 blocks in \$4600 = $4600 \div 250 = 18$ R \$100
Undiscounted price = $18 \times 300 + 100 = 5400 + 100 = \5500

Ans: a) Day 4
b) \$5500

12. a)

Let length of triangle = u

Base of triangle = p

Perimeter of ABCD = $4u + 4p$

Perimeter of PQRS = $2u + 4p$

Difference in perimeters = $(4u + 4p) - (2u + 4p) = 2u = 56$

$u = 56 \div 2 = 28 \text{ cm} = \text{length of QR}$

b)

Length of small square = sq root of 225 = 15 cm

Length of ABCD = $28 + 28 - 15 = 41 \text{ cm}$

Area of ABCD = $41 \times 41 = 1681 \text{ cm}^2$

Ans: a) 28 cm
b) 1681 cm²

13. a)

	Abel	Ben	Chris	
At first	35u			(x 7 x 5)
Changes	$(-\frac{1}{7} - \frac{2}{5}) \times 35u$	$+\frac{1}{7} \times 35u$	$+\frac{2}{5} \times 35u$	
Changes	-19u	+5u	+14u	
A the end	16u			

Fraction of Abel's tart in the end = $\frac{35-19}{35} = \frac{16}{35}$

b)

At the end 4p 3p 9p

Total at the end = $4p + 3p + 9p = 16p = 448$

$p = 448 \div 16 = 28$

At the end 112 84 252 (substitute p with 28)

$16u = 112, u = 112 \div 16 = 7$

Difference between Chris & Ben's = $(252 - 14u) - (84 - 5u) = 168 - 63 = 105$

Ans: a) $\frac{16}{35}$
b) 105

14. a)

Radius of big circle = 14 cm

Radius of small circle = $\frac{1}{2} \times (28 - 8) = 10$ cm

Area of small quarter circle = $\frac{1}{4} \times \pi \times 10 \times 10 = 25\pi$

Area of big quarter circle = $\frac{1}{4} \times \pi \times 14 \times 14 = 49\pi$

Difference = $49\pi - 25\pi = 24\pi$

Shaded area = $25\pi + 24\pi = 49\pi = 153.86$ cm²

b)

Perimeter of small quarter circle = $\frac{1}{4} \times \pi \times 2 \times 10 = 5\pi$

Perimeter of big quarter circle = $\frac{1}{4} \times \pi \times 2 \times 14 = 7\pi$

Perimeter of shaded area = $5\pi + 7\pi + 14 + 14 = 12\pi + 28 = 65.68$ cm

Ans: a) 153.86 cm²

b) 65.68 cm

15. a)

Base area of P = $1480 \div 18.5 = 80$ cm²

b)

Volume of water in Q at first = $2 \times 40 \times 9 = 720$ cm³

Total water volume = $1480 + 720 = 2200$ cm³

Total base area = $80 + 40 \times 9 = 440$ cm²

Water level in the end = $2200 \div 440 = 5$ cm

Ans: a) 80 cm²

b) 5 cm

16. a)

Let $100u$ = total number of stars

Silver stars = $0.3 \times 100u = 30u$

Bronze stars = $30u + 12$

Number of gold stars = $100u - 30u - 30u - 12 = 40u - 12 = 100$

$40u = 100 + 12 = 112$

$u = 112 \div 40 = 2.8$

Total number of bronze and gold stars = $100 + 30u + 12 = 196$

b)

At first, Bronze stars = 96, Silver stars = $30u = 84$, Gold stars = 100

Let p = increase in silver stars

Percent of silver stars = $\frac{(84+p) \times 100}{100+96+84+p} = 44$

$8400 + 100p = 44(280 + p) = 12320 + 44p$

$100p - 44p = 12320 - 8400 = 3920$

$56p = 3920$

$p = 3920 \div 56 = 70$ = number of silver stars from uncle

Ans: a) 196

b) 70

17. a)

$$\text{Height of plate} = 20 - 2 \times 6 = 8 \text{ cm}$$

b)

Arrangement A packs more plates

$$\text{Height of plates in Arrangement A} = n \times 6 + 2 = 6n + 2$$

$$6n + 2 = 100$$

$$6n = 100 - 2 = 98$$

$$n = 98 \div 6 = 16 \text{ R } 2 \approx 16 = \text{number of plate in A}$$

$$\text{Height of plates in Arrangement B} = 8n$$

$$8n = 100$$

$$n = 100 \div 8 = 12.5 \approx 12$$

$$\text{Additional plates in Arrangement A} = 16 - 12 = 4$$

Ans: a) 8 cm

b) 4
