Word Problem Worksheet

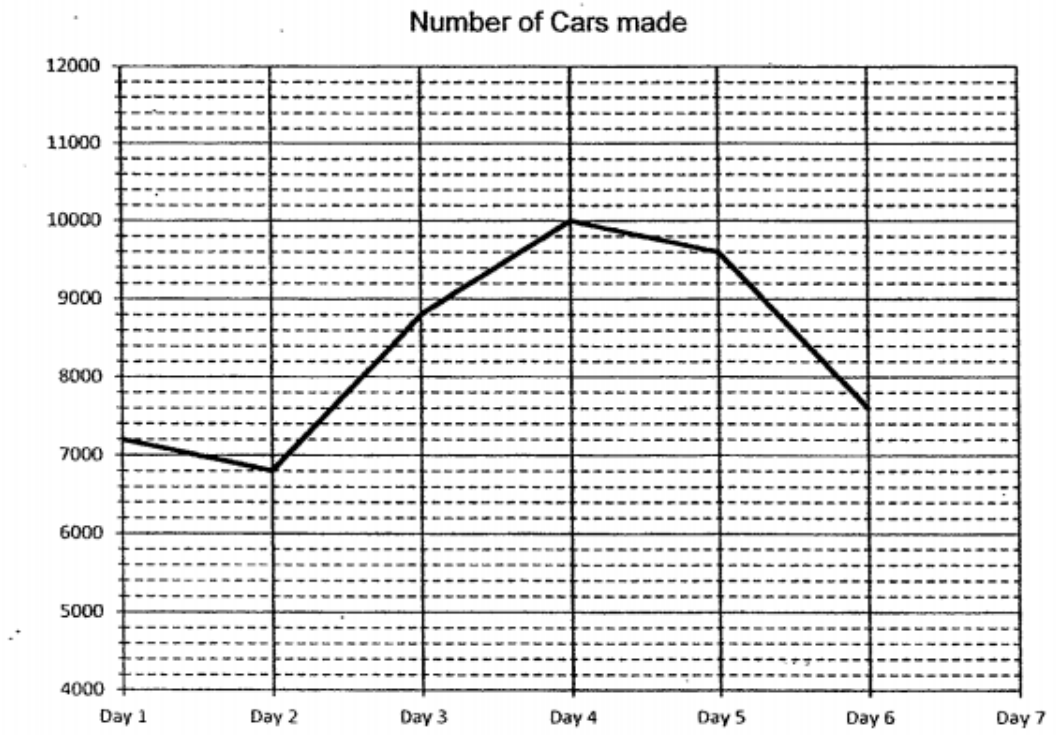
& Solutions

Rosyth Paper

P6 Mathematics SA1 2017

Show your working clearly in the space provided for each question and write your answers in the spaces provided.

6. A factory produced 60 000 cars over 7 days. The line graph shows the number of cars made in the factory over 6 days.



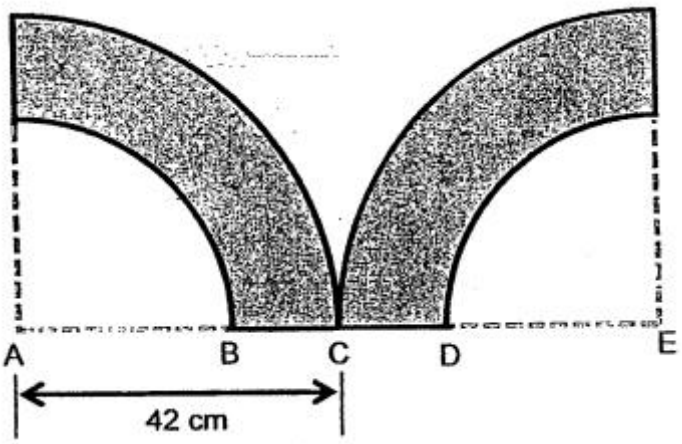
(a) What is the ratio of the number of cars produced on the 4th day to the total number of cars produced over the seven days? Express your answer in the simplest form.

(b) How many cars were made in the factory on day 7?

Ans: (a) _____

(b) _____

7. The outline of the figure below is formed by 2 identical large quarter circles, 2 identical small quarter circles and 3 straight lines. The length of AB = BD. The length of AC is 42 cm. Find the area of the shaded figure. Use the calculator value of π and correct your answer to 2 decimal places.



Ans: _____

8. Deo has 840 green heads. Ian has 960 red beads. Deo places 70% of his green beads into a box. Ian also places 70% of his red beads into the same box. What percentage of the beads in the box is red? Express your answer correct to 2 decimal places.

Ans: _____

9. At first, Alynna had a total of 86 toy cars and toy dolls. She gave away 38 toy cars and increased the number of toy dolls by 25%. After that, Alynna had a total of 60 toy cars and toy dolls. How many toy dolls did she have at first?

Ans: _____

10. Shi Yao had a total of 868 red pens and blue pens. After selling an equal number of both types of pen, she had $\frac{1}{4}$ of the red pens and $\frac{1}{5}$ of the blue pens left. What was the total number of blue and red pens left?

Ans: _____

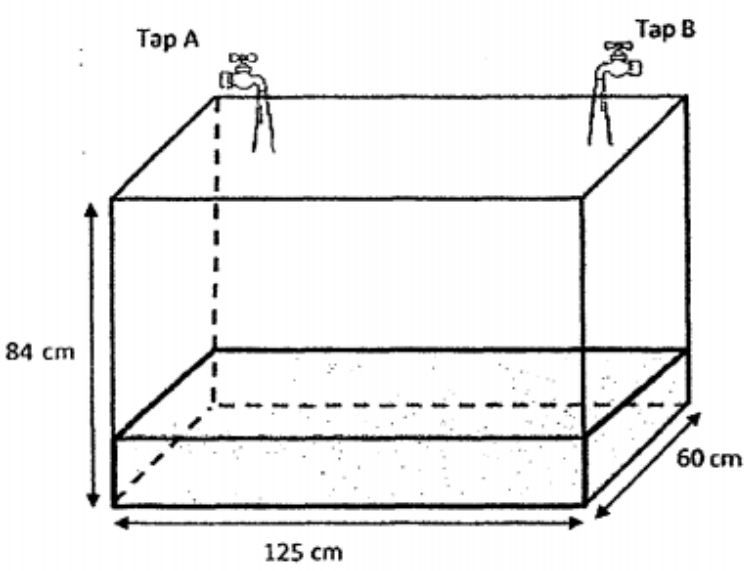
11. During the annual Prize Giving ceremony, the ratio of the number of gift cards to the number of cash vouchers the school prepared was 5 : 3. Each class received 4 gift cards and 5 cash vouchers. After all the classes had received their gift cards and cash vouchers, there were no more cash vouchers left but there were 78 gift cards left. How many cash vouchers were given out to all the classes?

Ans: _____

12. At first a tanks was $\frac{1}{5}$ filled with water. Two taps, A and B were used to fill up the tank. For the first 20 minutes, only tap A was turned on. The tank was half-filled with water after 20 minutes.

(a) How many litres of water were added to the tank by tap A in the first 20 minutes?

(b) Tap B was also turned on after 20 minutes. The tank was completely filled with water from tap A and tap B 15 minutes later. How many litres of water flowed out from Tap B in 1 minute?



Ans: (a) _____

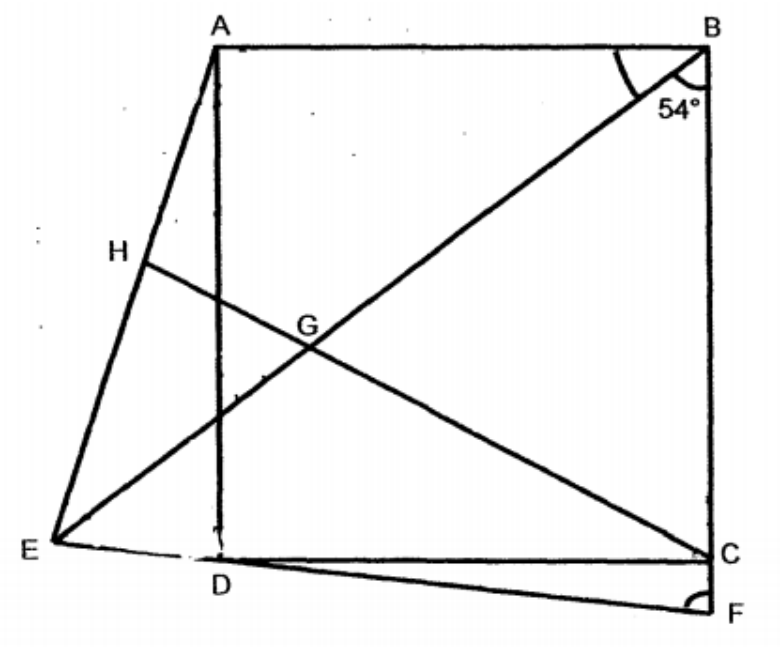
(b) _____

13. **KILLER QUESTION**

The figure ABCD is a square. 4 straight lines BCF, BGE, CGH and EDF are drawn to complete the figure shown below. AED is an isosceles triangle and BG = BC. ∠CBG is 54°.

(a) Find ∠ABG.

(b) Find ∠CFD



Ans: (a) _____

(b) _____

14. **KILLER QUESTION**

Box A contains only red pens and Box B contains only blue pens. There were twice as many red pens as blue pens. $\frac{1}{2}$ of the red pens were transferred into box B. At the same time, $\frac{2}{3}$ of the blue pens were transferred into box A.

(a) What fraction of the pens in box A after the transfer is red?

(b) After the transfer, 8 blue pens and 5 red pens were moved from Box A to Box B, the 2 boxes then had the same number of pens. How many blue pens were there?

Ans: (a) _____

(b) _____

15. Michelle and her classmates made identical paper stars to sell for charity. They made 4 paper stars from each piece of the coloured paper. 3 papers stars were damaged for every 16 pieces of coloured paper that were used. Each paper star that was not damaged was sold for 40 cents. They collected a total of $317.20.

(a) How many paper stars were sold?
(b) How many pieces of the coloured paper did they use altogether?

Ans: (a) _____

(b) _____

16. Yilin bought a dress for $117 after a 35% discount.
    (a) What was the price of the dress before the discount?
    (b) Yilin paid $147.60 for a blouse. The total discount for the dress and the blouse was $95.40. What was the percentage discount given for the blouse?

Ans: (a) _____

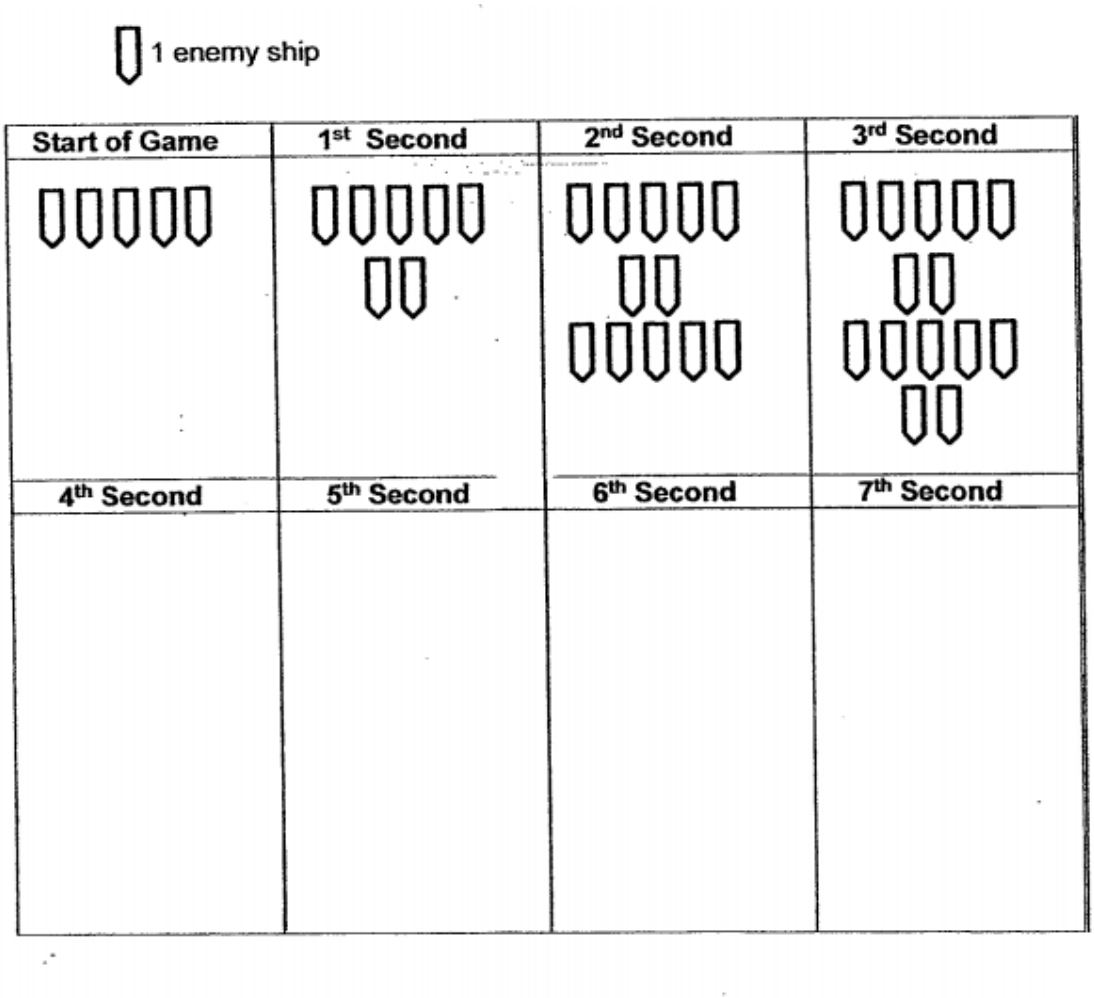
(b) _____

17. Bryan designed a computer game where the enemy ships appeared in a fixed pattern over time as shown below.

(a) How many enemy ships will appear in the 5th second?

(b) How many seconds after the game start would 124 enemy ships appear?

(c) How many enemy ships will appear at the 1 minute mark?



Ans: (a) _____

(b) _____

(c) _____

18. Mrs Teo bought 5 bags of rice and 5 bags of flour. 15 bags of rice weigh as much as 27 bags of flour. Each bag of rice weighs 2.6 kg more than each bag of flour.
    (a) What was the mass of each bag of rice?
    (b) What was the total mass of all the bags of rice and flour Mrs Teo bought?

Ans: (a) _____

(b) _____

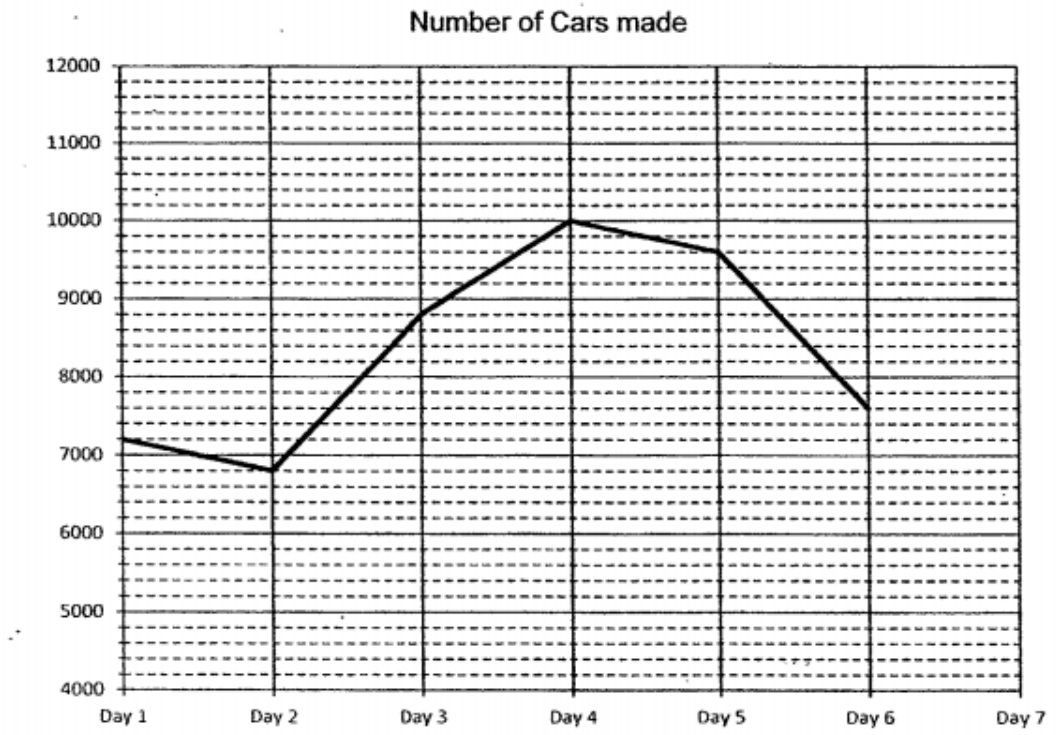
Answer Key

Subject: Primary 6 Maths – Word Problem Solutions
Paper: SA1 2017 Rosyth

6.	a)	1 : 6	b)	10 000		
7.	1539.38 cm^2					
8.	53.33%					
9.	48					
10.	196					
11.	90					
12.	a)	189 ℓ	b)	11.55 ℓ per min		
13.	a)	36°	b)	81 °		
14.	a)	$\frac{3}{5}$	b)	78		
15.	a)	793	b)	208		
16.	a)	$180	b)	18%		
17.	a)	21	b)	34 seconds	c)	215
18.	a)	5.85 kg	b)	45.5 kg		

Show your working clearly in the space provided for each question and write your answers in the spaces provided.

6. A factory produced 60 000 cars over 7 days. The line graph shows the number of cars made in the factory over 6 days.



(a) What is the ratio of the number of cars produced on the 4th day to the total number of cars produced over the seven days? Express your answer in the simplest form.

(b) How many cars were made in the factory on day 7?

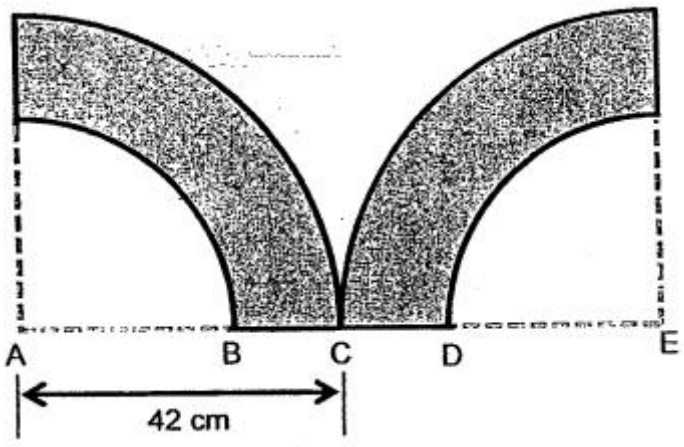
(a) Number of cars on 4th day = 10 000
Ratio of 4th day cars to total cars → 10 000 : 60 000 → 1 : 6

(b) Number of cars on 1st to 6th day = 7200 + 6800 + 8800 + 10000 + 9600 + 7600 = 50 000
Number of cars on 7th day = 60 000 – 50 000 = 10 000

Ans: (a) 1 : 6

(b) 10 000

7. The outline of the figure below is formed by 2 identical large quarter circles, 2 identical small quarter circles and 3 straight lines. The length of AB = BD. The length of AC is 42 cm. Find the area of the shaded figure. Use the calculator value of π and correct your answer to 2 decimal places.



Radius of large quarter circle = 42 cm
Let BC = u
AB = 2u
3u = 42 cm
Radius of small quarter circle = AB = 2u = 42 ÷ 3 x 2 = 28 cm
Area of 2 larger quarter circles = π x 42 x 42 ÷ 2 = 882 π
Area of 2 small quarter circles = π x 28 x 28 ÷ 2 = 392 π

Shaded area = 882 π - 392 π = 490 π = 490 x 3.142 = 1539.38 cm^2

Ans: 1539.38 cm^2

8. Deo has 840 green heads. Ian has 960 red beads. Deo places 70% of his green beads into a box. Ian also places 70% of his red beads into the same box. What percentage of the beads in the box is red? Express your answer correct to 2 decimal places.

70% of Deo's green beads = 0.7 x 840 = 588
70% of Ian's red beads = 0.7 x 960 = 672
Total in box = 588 + 672 = 1260

Percentage of red beads in box = 672 ÷ 1260 = 53.33%

Ans: 53.33%

9. At first, Alynna had a total of 86 toy cars and toy dolls. She gave away 38 toy cars and increased the number of toy dolls by 25%. After that, Alynna had a total of 60 toy cars and toy dolls. How many toy dolls did she have at first?

25% of toy dolls → 60 – (86 – 38) → 12

100% of toy dolls = 100 ÷ 25 x 12 = 48

Ans: 48

10. Shi Yao had a total of 868 red pens and blue pens. After selling an equal number of both types of pen, she had $\frac{1}{4}$ of the red pens and $\frac{1}{5}$ of the blue pens left. What was the total number of blue and red pens left?

Let r = number of red pens at first
b = number of blue pens at first

$\frac{3}{4}r = \frac{4}{5}b$ (1)
15r = 16b (1) x 20
r vs b ratio → 16 : 15 → 16u : 15u

16u + 15u = 868
31u = 868
u = 868 ÷ 31 = 28

Red pens left = $\frac{1}{4}$ x 16u = 4u
Blue pens left = $\frac{1}{5}$ x 15u = 3u
Total number of blue and red pens left = 4u + 3u = 7u = 7 x 28 = 196

Ans: 196

11. During the annual Prize Giving ceremony, the ratio of the number of gift cards to the number of cash vouchers the school prepared was 5 : 3. Each class received 4 gift cards and 5 cash vouchers. After all the classes had received their gift cards and cash vouchers, there were no more cash vouchers left but there were 78 gift cards left. How many cash vouchers were given out to all the classes?

Ratio of gifts cards to cash vouchers → 5 : 3 → 25u : 15u
Each class receive 5 cash vouchers
Number of classes = 15u ÷ 5 = 3u

Number of gift cards distributed = 4 x 3u = 12u
Number of gift cards left = 25u – 12u = 13u

13u → 78
u = 78 ÷ 13 = 6

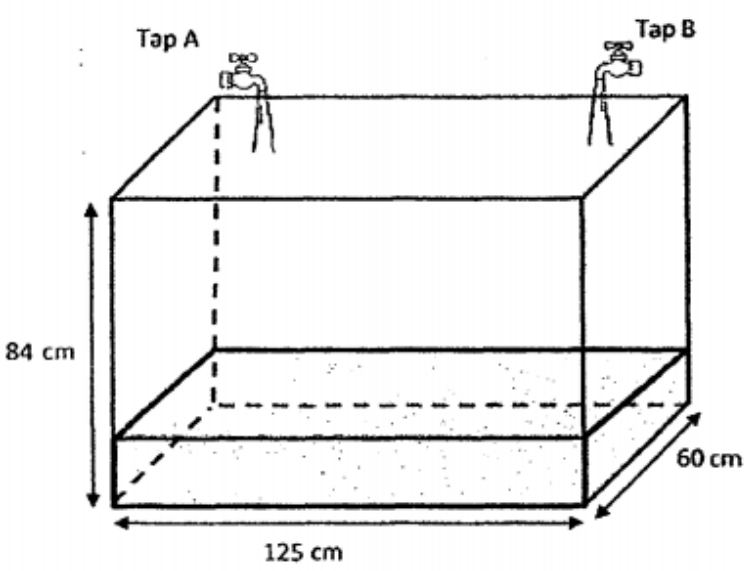
Cash vouchers given out = 15u = 15 x 6 = 90

Ans: 90

12. At first a tanks was $\frac{1}{5}$ filled with water. Two taps, A and B were used to fill up the tank. For the first 20 minutes, only tap A was turned on. The tank was half-filled with water after 20 minutes.

(a) How many litres of water were added to the tank by tap A in the first 20 minutes?

(b) Tap B was also turned on after 20 minutes. The tank was completely filled with water from tap A and tap B 15 minutes later. How many litres of water flowed out from Tap B in 1 minute?



(a) Let u = volume of tank = 125 x 60 x 84 = 630 000 cm^3 = 630 ℓ

$\frac{1}{2}u - \frac{1}{5}u = \frac{5}{10}u - \frac{2}{10}u = \frac{3}{10}u = \frac{3}{10}$ x 630 = 189 ℓ

(b) Rate of tap A flow = 189 ÷ 20 = 9.45 ℓ per min

Volume of water of tap A and B for 15 min = 630 x $\frac{1}{2}$ = 315 ℓ

Flow rate of tap A and B = 315 ÷ 15 = 21 ℓ per min

Flow rate of tap B = 21 – 9.45 = 11.55 ℓ per min

Ans: (a) 189 ℓ

(b) 11.55 ℓ per min

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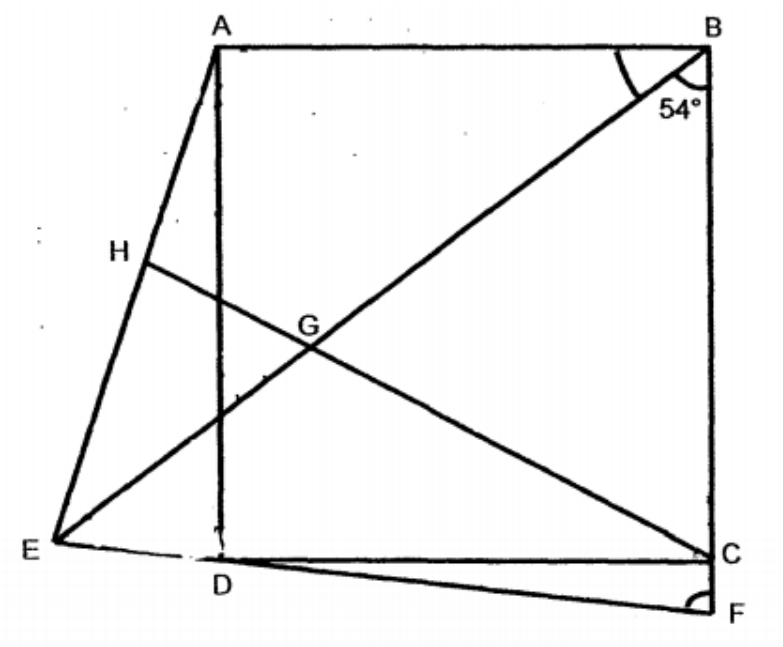
The figure ABCD is a square. 4 straight lines BCF, BGE, CGH and EDF are drawn to complete the figure shown below. AED is an isosceles triangle and BG = BC. ∠CBG is 54°.

(a) Find ∠ABG.

(b) Find ∠CFD



(a) ∠ABG = 90 – 54 = 36°

(b) AD = AE, AE = AB, △ABE is an isosceles triangle
BAE = 180 – 36 – 36 = 108
Let u = ∠CFD = ∠AED
Total of 4 internal angles of figure = 360
90 + 108 + u + u = 360
2u = 162
∠CFD = u= 81 °

Ans: (a) 36°

(b) 81 °

14. **KILLER QUESTION**

Box A contains only red pens and Box B contains only blue pens. There were twice as many red pens as blue pens. $\frac{1}{2}$ of the red pens were transferred into box B. At the same time, $\frac{2}{3}$ of the blue pens were transferred into box A.

(a) What fraction of the pens in box A after the transfer is red?

(b) After the transfer, 8 blue pens and 5 red pens were moved from Box A to Box B, the 2 boxes then had the same number of pens. How many blue pens were there?

At first, ratio of red pens in box A vs blue pens in box B→ 2 : 1 → 2u : u → 6u : 3u

After that

Box A	Box B
Red (6u – 3u) Blue(+ 2u)	Blue (3u – 2u) Red (+ 3u)
Red (3u) Blue (2u)	Blue (1u) Red (3u)
X2	
Red (6u) Blue (4u)	Blue (2u) Red (6u)

Fraction of red in box A = 3 ÷ 5 = $\frac{3}{5}$

Moving 1u from Box A to Box B makes Box A equal to Box B
1u = 8 + 5 = 13
Total number of blue pens = 4u + 2u = 6u = 6 x 13 = 78

Ans: (a) $\frac{3}{5}$

(b) _____

15. Michelle and her classmates made identical paper stars to sell for charity. They made 4 paper stars from each piece of the coloured paper. 3 papers stars were damaged for every 16 pieces of coloured paper that were used. Each paper star that was not damaged was sold for 40 cents. They collected a total of $317.20.

(a) How many paper stars were sold?
(b) How many pieces of the coloured paper did they use altogether?

(a)
Number of stars for 1 set of 16 pieces of coloured paper = 16 x 4 – 3 = 61
Amount for 1 set of 16 pieces of coloured paper = 61 x .40 = $24.4

Number of sets sold = 317.20 ÷ 24.4 = 13
Number of stars sold = 13 x 61 = 793

(b)
Number of coloured paper used = 13 x 16 = 208

Ans: (a) 793

(b) 208

16. Yilin bought a dress for $117 after a 35% discount.
    (a) What was the price of the dress before the discount?
    (b) Yilin paid $147.60 for a blouse. The total discount for the dress and the blouse was $95.40. What was the percentage discount given for the blouse?

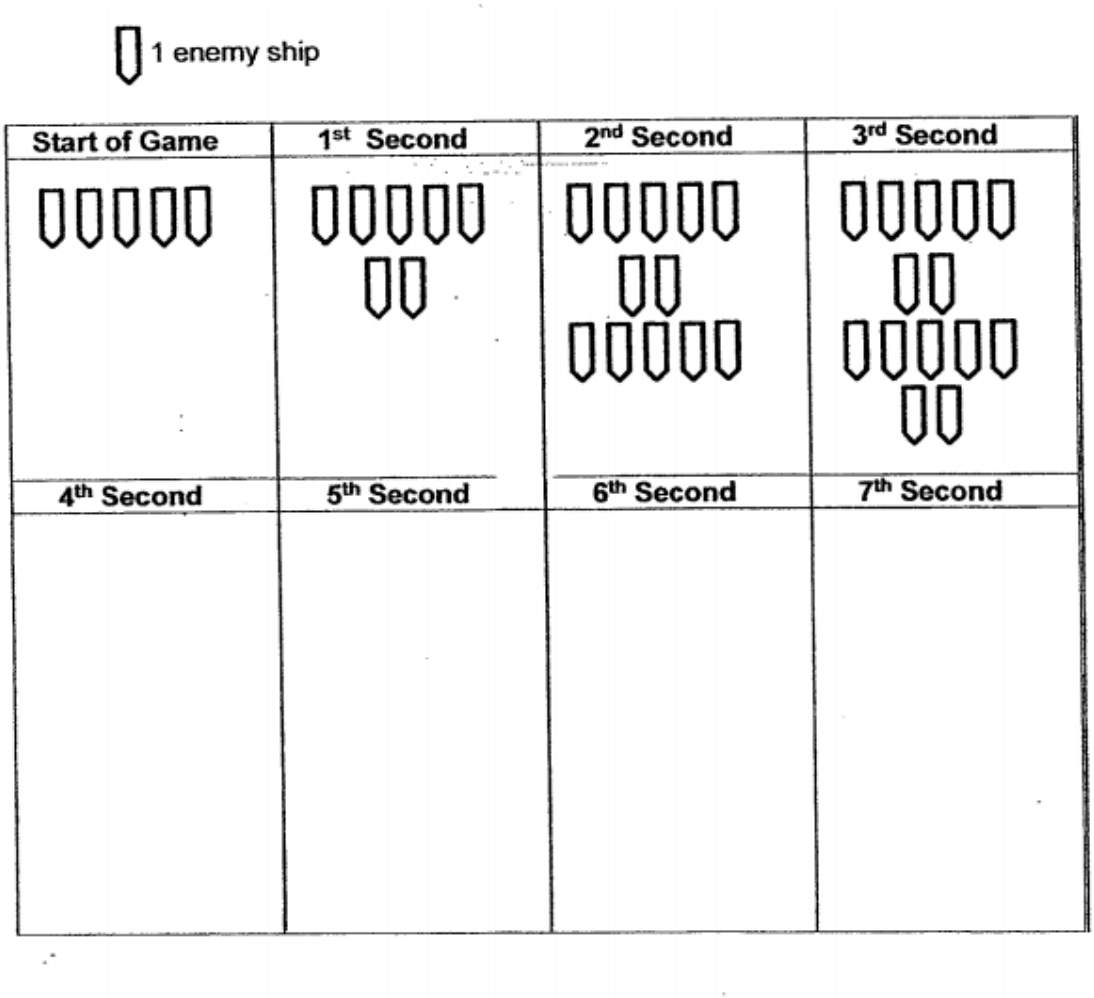
    (a) price of dress before discount = 117 ÷ 65 x 100 = $180
    Discount for dress = 180 – 117 = 63

    (b) Discount for blouse = 95.40 – 63 = $32.40
    Price of blouse before discount = 147.60 + 32.40 = $180
    Percentage discount for blouse = 32.40 ÷ 180 x 100 = 18%

Ans: (a) $180

(b) 18%

17. Bryan designed a computer game where the enemy ships appeared in a fixed pattern over time as shown below.
    (a) How many enemy ships will appear in the 5th second?
    (b) How many seconds after the game start would 124 enemy ships appear?
    (c) How many enemy ships will appear at the 1 minute mark?



Seconds : 0, 1, 2, 3
Enemy ships : 5, 7, 12, 14
(a)
Additional ship every 2 seconds = 7
Number of enemy ships on 5th second = 14 + 7 = 21
(b)
Number of 2 second intervals to reach 124 ships = (124 – 5) ÷ 7 = 17
Number of seconds = 17 x 2 = 34 seconds
(c)
Number of ships after 60 seconds = 5 + 7 x 60 ÷ 2 = 215

Ans: (a) 21
(b) 34 seconds
(c) 215

18. Mrs Teo bought 5 bags of rice and 5 bags of flour. 15 bags of rice weigh as much as 27 bags of flour. Each bag of rice weighs 2.6 kg more than each bag of flour.
(a) What was the mass of each bag of rice?
(b) What was the total mass of all the bags of rice and flour Mrs Teo bought?

15 bags of rice = 27 bags of flour
Ratio of mass of rice bag vs mass of flour bags
27 : 15 → 9 : 5 → 9u : 5u

Bag of rice minus bag of flour = 9u – 5u = 4u = 2.6kg
u = 2.6 ÷ 4 = 0.65
(a)
Mass of each bag of rice = 9u = 9 x 0.65 = 5.85 kg
(b)
Mass of each bag of flour = 5u = 5 x 0.65 = 3.25 kg

Total mass of all bags of rice and flour = 5 x 5.85 + 5 x 3.25 = 45.5 kg

Ans: (a) 5.85 kg

(b) _____