

Word Problem Worksheet  
& Solutions  
Red Swastika Paper  
P6 Mathematics SA1 2018

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. a)  
 $\angle t = 180 - 88 - 62 = 30^\circ$

b)  
 $\angle s + \angle v = 88^\circ$  (exterior angle theorem)  
 $\angle u + \angle w = 62^\circ$  (exterior angle theorem)

$$\angle s + \angle u + \angle v + \angle w = 88 + 62 = 150^\circ$$

Ans: (a)  $30^\circ$

(b)  $150^\circ$

7. Let mass of B =  $6u$   
 Mass of A =  $\frac{2}{3} \times 6u = 4u$   
 Mass of C =  $\frac{1}{2} \times 6u = 3u$   
 Total mass of A, B and C =  $4u + 3u + 6u = 13u = 338\text{kg}$   
 $u = 338 \div 13 = 26$   
 Mass of C =  $3u = 3 \times 26 = 78 \text{ kg}$

Ans: 78 kg

8. Perimeter of 2 semi-circle =  $0.7\pi = 0.7 \times 3.14 = 2.2$  cm

Perimeter of banner =  $4 + 4 + 2.2 = 10.2$  cm

Ans: 10.2 cm

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9. Area of quadrant AOB =  $\frac{22}{7} \times 14 \times 14 \times \frac{1}{4} = 154$  cm<sup>2</sup>

Area of white areas =  $7 \times 7 + 7 \times 7 = 98$  cm<sup>2</sup>

Shaded area =  $154 - 98 = 56$  cm<sup>2</sup>

Ans: 56 cm<sup>2</sup>

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10. Area of triangle =  $\frac{1}{2} \times 5 \times 12 = 30 \text{ cm}^2$

Area of semi-circle AB =  $\frac{1}{2} \times 6 \times 6 \pi = 18 \pi \text{ cm}^2$

Area of semi-circle BC =  $\frac{1}{2} \times 2.5 \times 2.5 \times \pi = 3.125 \pi \text{ cm}^2$

Area of triangle and 2 semi-circles =  $30 + 18 \pi + 3.125 \pi = 30 + 21.125 \pi$

Area of semi-circle AC =  $\frac{13}{2} \times \frac{13}{2} \times \pi \times \frac{1}{2} = 21.125 \pi \text{ cm}^2$

Shaded area =  $30 + 21.125 \pi - 21.125 \pi + 30 = 60 \text{ cm}^2$

Ans:  $60 \text{ cm}^2$

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11. a)  
Let total number of keychains made =  $28u$   
( $7 \times 4 = 28 =$  Common multiple)

$$\frac{5}{7} \text{ of keychains} = \frac{5}{7} \times 28u = 20u$$

$$\text{Remaining keychains} = 28u - 20u = 8u$$

$$\frac{3}{4} \text{ of remaining keychains} = \frac{3}{4} \times 8u = 6u$$

$$\text{Rest of keychains} = 8u - 6u = 2u$$

$$\text{Fraction given out as free samples} = \frac{2u}{28u} = \frac{1}{14}$$

- b)  
Let number of keychains in small bag =  $p$   
Number of keychains in medium bag =  $4p$   
Number of keychains in big bag =  $p + 6$

$14p + 4 \times 4p = 20u$	( $\frac{5}{7}$ of keychains)
$30p = 20u$	(1)
$6 \times (p + 6) = 6u$	( $\frac{3}{4}$ of remaining keychains)
$6p + 36 = 6u$	
$30p + 180 = 30u$	(2)
$180 = 10u$	(2) – (1)
$u = 18$	
$30p = 20u = 20 \times 18 = 360$	substitute $u$ into (1)
$p = 360 \div 30 = 12$	

$$\text{Number of keychains in all 6 big bags} = 6 \times (p + 6) = 6 \times 18 = 108$$

Ans: (a)  $\frac{1}{14}$   
(b) 108

12. At first,  
Ratio of number of marble Benny had to what Danny had  $\rightarrow 1 : 4 \rightarrow 1u : 4u$   
At the end,  
Ratio of number of marble Benny had to what Danny had  $\rightarrow 5 : 6 \rightarrow 15u : 18u$

Where differences between Danny and Benny for both times are same =  $3u$

Difference in number of marbles of Benny before and after =  $14u$

Difference in number of marbles of Danny before and after =  $14u$

$$14u = 70$$

$$u = 5$$

$$\text{Number of marbles at first} = 1u + 4u = 5u = 5 \times 5 = 25$$

Ans: 25

13. Last year,  
Ratio of number of boys last year to number of girls  $\rightarrow b : g$   
This year,  
Ratio of number of boys last year to number of girls  $\rightarrow 120b : 90g$

$$120b = 90g$$

$$b = \frac{90}{120}g = \frac{3}{4}g$$

$$\text{Total number of students last year} = b + g = 210$$

$$\frac{3}{4}g + g = 210 \quad (\text{substitute } b)$$

$$\frac{7}{4}g = 210$$

$$g = 210 \times \frac{4}{7} = 120$$

$$b = 210 - g = 210 - 120 = 90$$

$$\text{Number of boys this year} = 90 \times 1.2 = 108$$

$$\text{Number of girls this year} = 0.9 \times 120 = 108$$

$$\text{Total students this year} = 108 \times 2 = 216$$

Ans: 216

14. a)  
Time taken by Jin Hao to complete the track =  $12 \div 8 = 1.5$  hours

b)

Let  $t$  = time elapsed hours from start time.

When they met each other their total distance = 12 km

$$\text{Total distance} = 8t + 7t = 12$$

$$15t = 12$$

$$t = \frac{12}{15} = \frac{4}{5} \text{ hour} = \frac{4}{5} \times 60 \text{ min} = 48 \text{ minutes}$$

Time they pass each other = 5.48 pm

Ans: (a) 1.5 hours

(b) 5.48 pm

15. 2 hours after pipes are turned on,

$$\text{Fraction of pool filled by Pipe A} = \frac{1}{6} \times 2 = \frac{1}{3}$$

$$\text{Fraction of pool filled by Pipe B} = \frac{1}{8} \times 2 = \frac{1}{4}$$

$$\text{Fraction of pool left to be filled after 2 hours} = 1 - \frac{1}{3} - \frac{1}{4} = \frac{5}{12}$$

$$\text{Fraction of pool filled per hour by Pipes A, B \& C} = \frac{1}{6} + \frac{1}{8} - \frac{1}{12} = \frac{5}{24}$$

$$\text{Number of hours to fill } \frac{5}{12} \text{ of pool} = \frac{5}{12} \div \frac{5}{24} = 2 \text{ hour}$$

$$\text{Total time to fill the pool} = 2 + 2 = 4 \text{ hours}$$

Ans: 4 hours

16. Number of marks if all words spelled correctly =  $5 \times 100 = 500$

Number of marks lost for each word spelled wrongly =  $5 + 2 = 7$

Difference between full marks =  $500 - 409 = 91$

Number of words spelled wrongly =  $91 \div 7 = 13$

Number of words spelled correctly =  $100 - 13 = 87$

Ans: 87

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17. a)

Let  $n$  = figure number

Number of dots on each side =  $n + 1$

When  $n = 5$

Number of dots on each side =  $n + 1 = 5 + 1 = 6$

Total number of dots =  $5n$

When  $n = 5$

Total number of dots =  $5n = 5 \times 5 = 25$

b)

When total number of dots =  $5n = 225$

$n = 225 \div 5 = 45$

Number of dots on each side =  $n + 1 = 45 + 1 = 46$

c)

When number of dots on each side =  $n + 1 = 75$

$n = 75 - 1 = 74$

Total number of dots =  $5n = 5 \times 75 = 375$

Ans: (a) 6, 25  
(b) 46  
(c) 375

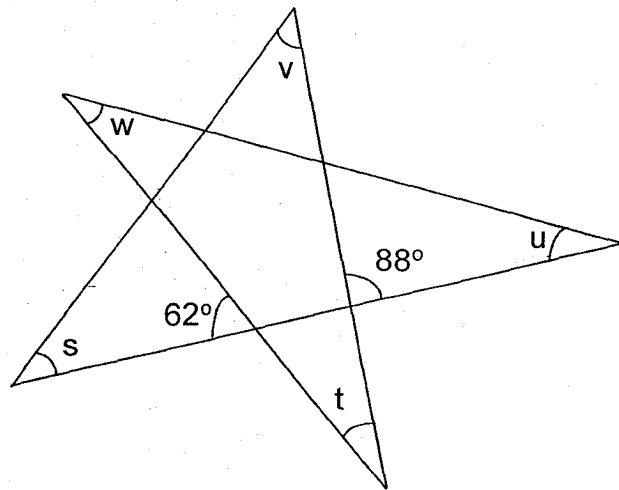
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For Questions 6 to 17, show your working clearly and write your answers in the spaces provided. The number of marks available is shown in brackets [ ] at the end of each question or part-question. (45 marks)

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- 6 The diagram below is made up of straight lines.  
 (a) Find  $\angle t$ .  
 (b) Find the sum of  $\angle s$ ,  $\angle u$ ,  $\angle v$  and  $\angle w$ .



Ans: (a) \_\_\_\_\_ [1]

(b) \_\_\_\_\_ [2]

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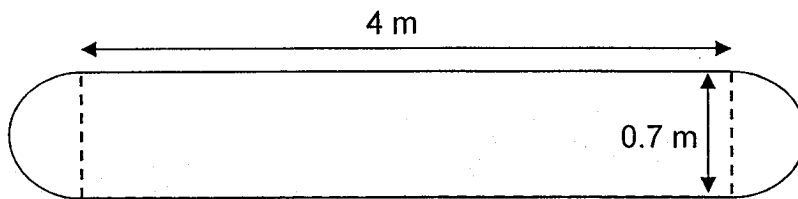
- 7 The mass of A is  $\frac{2}{3}$  of the mass of B. The mass of C is  $\frac{1}{2}$  of the mass of B. Their total mass is 338 kg. Find the mass of C.

Ans: \_\_\_\_\_ [3]

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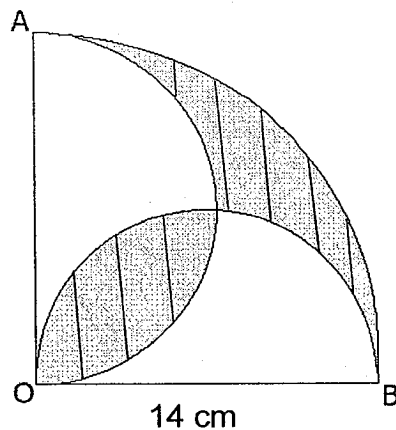


- 8 A banner is made up of a rectangle and two identical semicircles. The length of the rectangle is 4 m and the diameter of each semicircle is 0.7 m. Find the perimeter of the banner, rounded off to one decimal place. (Take  $\pi = 3.14$ )

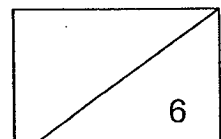


Ans: \_\_\_\_\_ [3]

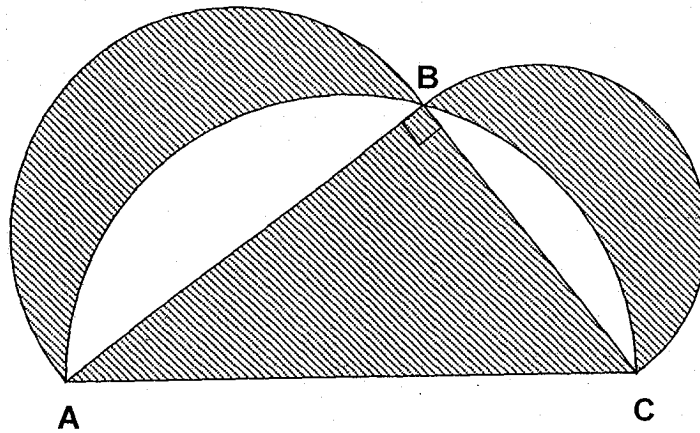
- 9 In the figure below, not drawn to scale, AOB is a quadrant of radius 14 cm. AO and BO are the diameters of two semicircles. Find the total shaded area. (Take  $\pi = \frac{22}{7}$ )



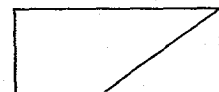
Ans: \_\_\_\_\_ [3]



- 10 The figure shows 2 semicircles overlapping the biggest semicircle. The diameters of the 3 semicircles form the sides of a right-angled triangle ABC where  $AB = 12$  cm,  $BC = 5$  cm and  $AC = 13$  cm. Find the area of the shaded region.  
(Take  $\pi = 3.14$ )



Ans: \_\_\_\_\_ [5]

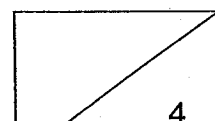


- 11 Miss Charlene made keychains for a donation drive.  $\frac{5}{7}$  of the keychains were packed into 14 small bags and 4 medium bags.  $\frac{3}{4}$  of the remaining keychains were packed into 6 big bags. The rest of the keychains were given out as free samples. Each medium bag contained 4 times as many keychains as each small bag. Each big bag contained 6 more keychains than each small bag.

- (a) What fraction of the keychains were given out as free samples?  
(Give your answer in its simplest form.)
- (b) How many keychains were there in all the big bags?

Ans: (a) \_\_\_\_\_ [1]

(b) \_\_\_\_\_ [3]



- 12 Benny and Danny shared a box of marbles. At first, the number of marbles Benny had to the number of marbles Danny had was  $1 : 4$ . After they had bought another 70 marbles each, the number of marbles Danny had was  $\frac{1}{5}$  more than the number of marbles Benny had. How many marbles were there in the box at first?

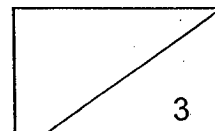
Ans: \_\_\_\_\_ [4]

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- 13 There were 210 students in a Speech and Drama class last year. Some boys signed up for the class this year and the number of boys increases by 20%. However, there were some girls who withdrew from the class and the number of girls decreases by 10%. There is now an equal number of girls and boys in the class. How many students are there in the Speech and Drama class this year?

Ans: \_\_\_\_\_ [3]

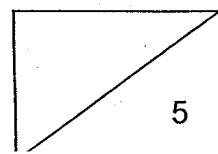


- 14 Mindy and Jin Hao went for a jog around a 12-km circular track at 5.00 p.m. They started at the same point but went in the opposite directions. Mindy's jogging speed was 7 km/h and Jin Hao was 8 km/h. They did not change their speed throughout the jog.

- (a) How long did Jin Hao take to complete the track?  
(b) At what time did they first pass each other?

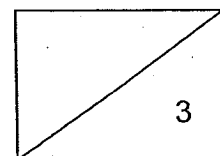
Ans: (a) \_\_\_\_\_ [2]

(b) \_\_\_\_\_ [3]



- 15 The Lee Family uses two pipes to fill their swimming pool. Pipe A fills the pool in 6 hours. Pipe B fills the pool in 8 hours. 2 hours after both pipes are turned on, Mr Lee accidentally turns on Pipe C which can drain the swimming pool completely in 12 hours. With all 3 pipes turned on, what is the total time taken to fill the swimming pool completely?

Ans: \_\_\_\_\_ [3]





- 16 Leslie entered a Spelling Bee competition. There were 100 words to be spelt. 5 marks were awarded for every word that is spelt correctly but 2 marks were deducted for every word spelt wrongly. Leslie scored 409 marks, how many words did he spell correctly?

Ans: \_\_\_\_\_ [4]

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17 Dots are drawn at regular intervals along the sides of a five-sided figure.

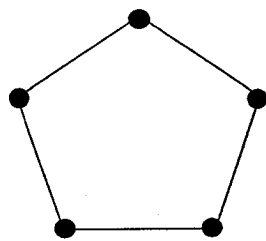


Figure 1

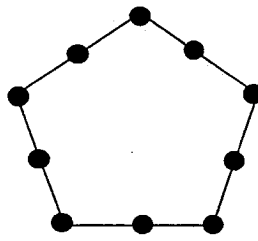


Figure 2

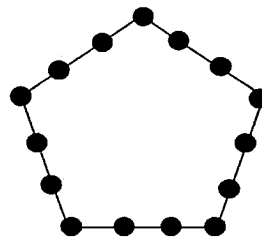


Figure 3

(a) Complete the table below for Figure 5.

Figure	Number of dots on each side	Total number of dots
1	2	5
2	3	10
3	4	15
4	.....	.....
5	_____	_____

[2]

(b) When a total of 225 dots are drawn, how many dots will there be on each side of the five-sided figure?

(c) If there are 75 dots on each side of the five-sided figure, how many dots are there altogether?

Ans: (b) \_\_\_\_\_ [1]

(c) \_\_\_\_\_ [2]

