

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Paper 1: Booklet A

Questions 1 to 10 carry 1 mark each. Questions 11 to 15 carry 2 marks each.

Choose the correct answer and write its number in the brackets provided.

All diagrams are not drawn to scale. The use of calculators is not allowed. (20 marks)

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1. Multiply 30 by  $w$ , then subtract 11 from the product. The result is \_\_\_\_\_.

- (1)  $11w - 30$  (2)  $w - 330$  (3)  $11 - 30w$  (4)  $30w - 11$

$$30 \times w = 30w$$

$$30w - 11 = 30w - 11$$

Ans: (4)

2. Which of the following fractions is the nearest to 1?

- (1)  $\frac{1}{3}$  (2)  $\frac{2}{5}$  (3)  $1\frac{1}{4}$  (4)  $\frac{7}{6}$

$$\frac{1}{3} = 0.333\dots \text{ (Difference = 0.666\dots)}$$

$$\frac{2}{5} = 0.4 \text{ (Difference = 0.6)}$$

$$1\frac{1}{4} = 1.25 \text{ (Difference = 0.25)}$$

$$\frac{7}{6} = 1.166\dots \text{ (Difference = 0.166\dots)}$$

Ans: (4)

3. What is the value of  $\frac{3r - 5}{4} + 6r$  when  $r = 7$ ?
- (1) 46            (2) 52            (3) 58            (4) 62

$$\begin{aligned} \frac{3 \times 7 - 5}{4} + 6 \times 7 &= \frac{21 - 5}{4} + 42 \\ &= \frac{16}{4} + 42 \\ &= 4 + 42 \\ &= 46 \end{aligned}$$

Ans: (1)

4. Arrange the following from the heaviest to the lightest.

5 kg 85 g             $5\frac{2}{3}$  kg            5.55 kg

- (1)  $5\frac{2}{3}$  kg, 5 kg 85 g, 5.55 kg            (2)  $5\frac{2}{3}$  kg, 5.55 kg, 5 kg 85 g
- (3) 5 kg 85 g,  $5\frac{2}{3}$  kg, 5.55 kg            (4) 5.55 kg,  $5\frac{2}{3}$  kg, 5 kg 85 g

$$5 \text{ kg } 85 \text{ g} = 5085 \text{ g}$$

$$5\frac{2}{3} \text{ kg} = 5666.666\dots \text{ g}$$

$$5.55 \text{ kg} = 5550 \text{ g}$$

Heaviest to lightest:  $5\frac{2}{3}$  kg, 5.55 kg, 5 kg 85 g

Ans: (2)

5. Find the missing number.  $? : 4 = 15 : 6$ .

- (1) 5
- (2) 10
- (3) 11
- (4) 13

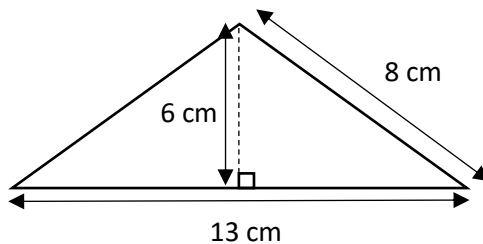
(2)

6. Express  $3\frac{2}{7}$  as a decimal, giving your answer correct to 2 decimal places.

- (1) 3.28
- (2) 3.29
- (3) 3.30
- (4) 3.27

(2)

7. Find the area of the triangle.



- (1)  $24 \text{ cm}^2$
- (2)  $52 \text{ cm}^2$
- (3)  $39 \text{ cm}^2$
- (4)  $48 \text{ cm}^2$

(3)

8. Which of the following ratios is the same as 3 : 9.
- (1) 1 : 2
  - (2) 1 : 5
  - (3) 2 : 7
  - (4) 2 : 6 (4)
9. Mr Tan gave 240 apples to 3 of his students in the ratio 1 : 4 : 7. How many apples did the student with the most apples get?
- (1) 20
  - (2) 80
  - (3) 120
  - (4) 140 (4)
10. Mary bought green and red beads in the ratio of 5 : 12. If she bought 60 green beads, how many more red beads than green beads did she buy?
- (1) 12
  - (2) 14
  - (3) 72
  - (4) 84 (4)

11.  $\frac{1}{4}$  of the people at a funfair were children and the rest were adults.  $\frac{2}{9}$  of the adults were women. What fraction of the people at the funfair were women?

(1)  $\frac{1}{3}$

(2)  $\frac{1}{4}$

(3)  $\frac{1}{6}$

(4)  $\frac{1}{12}$

(3)

12. Find the missing number in the sequence.

19 203,

29 406,

\_\_\_\_\_,

49 812

(1) 39 609

(2) 48 609

(3) 39 507

(4) 39 600

(1)

13. Jacob has 540 cups. He gave  $\frac{1}{4}$  of them to his sister and  $\frac{2}{9}$  of the remainder to his brother. How many cups did Jacob have left?

- (1) 30  
(2) 90  
(3) 105  
(4) 315

$$1 - \frac{1}{4} = \frac{3}{4}$$

$$\frac{2}{9} \times \frac{3}{4} = \frac{1}{6}$$

$$1 - \frac{1}{4} - \frac{1}{6} = \frac{7}{12}$$

$$\frac{7}{12} \times 540 = 315 \text{ (Ans)}$$

(4)

14. Catherine has twice as much money as Annie. Ben has thrice as much money as Catherine. If Annie and Ben have \$350 in total, how much money does the 3 children have altogether?

- (1) \$50  
(2) \$100  
(3) \$400  
(4) \$450

Catherine → 2 units; Ben → 6 units; Annie → 1 unit

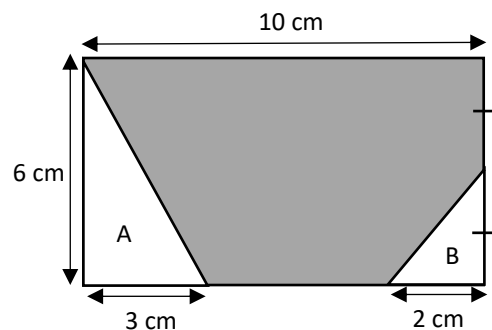
7 units → \$350

1 unit →  $\$350 \div 7 = \$50$

9 units →  $9 \times \$50 = \$450$  (Ans)

(4)

15. Find the area of the shaded part.



- (1)  $12 \text{ cm}^2$   
(2)  $48 \text{ cm}^2$   
(3)  $60 \text{ cm}^2$   
(4)  $72 \text{ cm}^2$

Area of rectangle =  $10 \text{ cm} \times 6 \text{ cm}$

$$= 60 \text{ cm}^2$$

Area of triangle A =  $\frac{1}{2} \times 3 \text{ cm} \times 6 \text{ cm}$

$$= 9 \text{ cm}^2$$

Area of triangle B =  $\frac{1}{2} \times 2 \text{ cm} \times 3 \text{ cm}$

$$= 3 \text{ cm}^2$$

Area of shaded part →  $60 \text{ cm}^2 - 9 \text{ cm}^2 - 3 \text{ cm}^2$

$$= 48 \text{ cm}^2 \text{ (Ans)}$$

(2)

Paper 1: Booklet B

Questions 16 to 20 carry 1 mark each. Questions 21 to 30 carry 2 marks each.  
The use of calculators is not allowed. (25 marks)

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16. Find the fraction that is halfway between  $\frac{2}{7}$  and  $\frac{3}{7}$ .

$$\frac{2}{7} = \frac{4}{14}, \quad \frac{3}{7} = \frac{6}{14}$$

$$\text{Ans: } \frac{5}{14} \text{ (Ans)}$$

Ans : \_\_\_\_\_

17. Express 21 ones, 1 tenths and 10 thousandths as a decimal.

$$21.11 \text{ (Ans)}$$

Ans : \_\_\_\_\_

18. Hui Leng bought 4 ring files and gave the cashier \$50. She received \$a as change. Find the cost of each file in terms of a.

$$\$ \left( \frac{50-a}{4} \right) \text{ (Ans)}$$

Ans : \_\_\_\_\_

19. The total length of 3 ribbons is  $\frac{11}{12}$  m. What is the average length of 1 ribbon?

$$\begin{aligned} \frac{11}{12} \div 3 &= \frac{11}{12} \times \frac{1}{3} \\ &= \frac{11}{36} m \end{aligned}$$

Ans : \_\_\_\_\_

20. Find the missing number in the box below.

$$50 - (\text{_____} \div 3 + 10) = 30$$

$$\text{_____} \div 3 + 10 = 20$$

$$\text{_____} \div 3 = 10$$

$$\text{_____} = 30 \text{ (Ans)}$$

Ans : \_\_\_\_\_

21. Timothy and Bryan had the same amount of money at first. After Timothy spent \$53 and Bryan spent \$17, Bryan had thrice as much money as Timothy. How much money did each of them have at first?

$$\$53 - \$17 = \$36$$

$$2 \text{ units} = \$36$$

$$1 \text{ unit} = \$36 \div 2$$

$$= \$18$$

$$\$18 + \$53 = \$71 \text{ (Ans)}$$

Ans : \_\_\_\_\_

22. Mr Tan gave  $\frac{1}{3}$  of his salary to his wife and  $\frac{1}{5}$  of his remaining salary to each of his 2 sons. What fraction of his salary did Mr Tan give away? Leave your answer in the simplest form.

$$1 - \frac{1}{3} = \frac{2}{3}$$

$$\frac{1}{5} \times \frac{2}{3} = \frac{2}{15}$$

$$\frac{1}{3} + \frac{2}{15} + \frac{2}{15} = \frac{9}{15}$$

$$= \frac{3}{5}$$

Ans : \_\_\_\_\_



23. Samuel has  $\frac{3}{5}$  kg of flour. He used  $\frac{1}{2}$  kg of flour and  $\frac{3}{5}$  of the remainder to bake some cookies. How much flour did he have left?

$$\frac{3}{5} - \frac{1}{2} = \frac{1}{10}$$

$$\frac{2}{5} \times \frac{1}{10} = \frac{1}{25} \text{ kg (Ans)}$$

Ans : \_\_\_\_\_

24. Abby, Bryan and Carl received some money from their parents. The ratio of the total amount of money Abby and Bryan received to the total amount of money that Bryan and Carl received was 9 : 16. Abby received twice as much money as Bryan. Find the fraction of the amount of money Carl received to the total amount of money received by the 3 children.

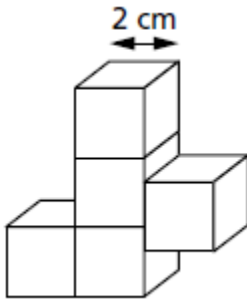
Abby	:	Bryan	:	Carl
$2 \times 3$		$1 \times 3$		
6		3		13
└──────────┘		└──────────┘		
	9	16		

$$6 \text{ units (Abby)} + 3 \text{ units (Bryan)} + 13 \text{ units (Carl)} = 22 \text{ units}$$

$$\frac{13}{22} \text{ (Ans)}$$

Ans : \_\_\_\_\_

25. The solid below is made up of five 2 cm cubes. Sheryl painted the entire solid with pink paint. What area of the figure is covered in pink paint?



$$\text{Total number of faces painted pink} = 5 + 5 + 3 + 5 + 4 = 22$$

$$\text{Area of 1 face} = 2 \times 2 = 4 \text{ cm}^2$$

$$\text{Total area painted pink} = 4 \times 22 = 88 \text{ cm}^2$$

Ans : \_\_\_\_\_

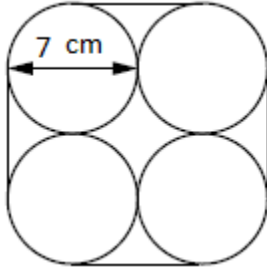
26. May is  $x$  years old now. May is twice as old as Peter. What is Peter's age 6 years from now? Give your answer in terms of  $x$ .

$$\text{Peter's age} = \frac{x}{2}$$

$$\text{Peter's age 6 years from now} = \left(\frac{x}{2} + 6\right) \text{ years old}$$

Ans: \_\_\_\_\_

27. Four pipes of diameter 7 cm are held tightly together by a metal band as shown in the diagram below. How long is the band? (Take  $\pi = \frac{22}{7}$ )



$$\frac{22}{7} \times 7 = 22$$

$$22 + 4 \times 7 = 50$$

Ans: 50 cm

Ans: \_\_\_\_\_

28. Mrs Tan had  $\frac{8}{9}$  of a pizza. Each person ate  $\frac{1}{3}$  of a pizza until there is not enough pizza for another person. What fraction of the pizza was left?

$$\frac{8}{9} \div \frac{1}{3}$$

$$= \frac{8}{9} \times 3$$

$$= \frac{8}{3}$$

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

$$\frac{2}{3} \times \frac{1}{3} = \frac{2}{9} \text{ (Ans)}$$

Ans: \_\_\_\_\_

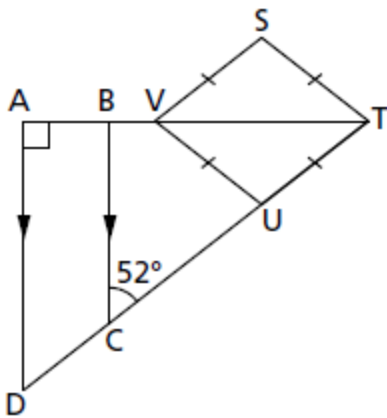
29. If today is Wednesday, what day would it be after 100 days?

$$100 \div 7 = 14 \text{ r } 2$$

2 days after Wed  $\rightarrow$  **Friday (Ans)**

Ans: \_\_\_\_\_

30. In the figure below, not drawn to scale, STUV is a rhombus and BTC is a right angled triangle. BC is parallel to AD and  $\angle BCU$  is  $52^\circ$ , find  $\angle VST$ .



$$\angle BTU = 180^\circ - 90^\circ - 52^\circ = 38^\circ$$

$$180^\circ - (38^\circ \times 2) = \mathbf{104^\circ}$$

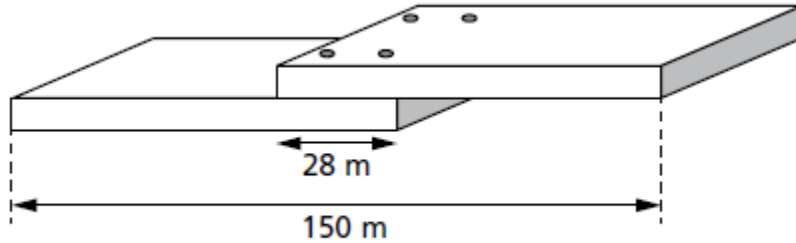
Ans: \_\_\_\_\_

**Paper 2 (You can use a calculator)**

Questions 1 to 5 carry 2 marks each. (Total 10 marks)

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- (1) Two identical rectangular plank was nailed together to form the figure below. The overlapped portion is 28 m long. Find the length of one piece of plank before it was nailed together.



$$(150 - 28) \div 2 = 61$$

$$61 + 28 = \mathbf{89\ m}$$

Ans: \_\_\_\_\_

- (2) Cheryl and Benjamin had the same number of pen at first. Cheryl gave away 120 pens and Benjamin gave away  $\frac{2}{3}$  of his pens. In the end, the ratio of pen Cheryl's left to the number of pens Benjamin left is 2:1. How many pens did Cheryl has left in the end?

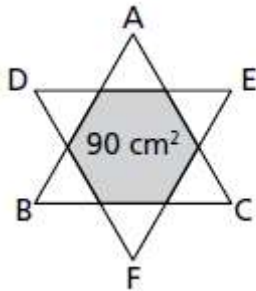
$$3u - 2u = 1u$$

$$1u = 120$$

$$2u = \mathbf{240\ pens}$$

Ans: \_\_\_\_\_

- (3) Triangle ABC and Triangle DEF are identical triangles. They overlapped each other to form 6 identical triangles as shown below. The area of the shaded part is  $90\text{cm}^2$  and the total area of the unshaded parts is  $96\text{cm}^2$ . Find the area of the triangle ABC.



$$96 \div 6 = 16$$

$$16 \times 3 = 48$$

$$48 + 90 = \underline{\underline{138\text{cm}^2}}$$

Ans: \_\_\_\_\_

- (4) Tim had some bags of paper clips. The average number of paper clips in each bag was 146. After Tim added another bag containing 128 paper clips, the average number of paper clips in each bag became 143. How many bags of paper clips were there after the new bag was added?

$$146 - 143 = 3$$

$$15 \div 3 = 5$$

$$5 + 1 = \underline{\underline{6 \text{ bags}}}$$

Ans: \_\_\_\_\_

- (5) Fran has some chocolates. If she gives each of her camp mates 7 chocolates, the last camp mate will only have 2 chocolates. If she gives to the same number of camp mates 4 chocolates each, she will have 73 chocolates left. How many camp mates does Fran have?

$$7 - 2 = 5$$

$$73 + 5 = 78$$

$$78 \div 4 = 19.5$$

$$78 \div 3 = \underline{\underline{26 \text{ camp mates}}}$$

Ans: \_\_\_\_\_

For questions 6 to 17, show your working clearly in the space provided for each question and write your answer in the space provided.

The number of marks available is shown in the brackets ( ) at the end of each questions or part-questions. (Total 45 marks)

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- (6) Max cake shop sells Double Chocolate muffins at \$4.50 each and Strawberry muffin at \$3.90 each. Leslie bought both muffins for his class party. He paid a total of \$308.40 for 74 muffins. How many Double Chocolate Chips muffins did Leslie buy?

Assume 74 strawberry muffins

$$\$3.90 \times 74 = \$288.60$$

$$\$308.40 - \$288.60 = \$19.80$$

$$\$4.50 - \$3.90 = \$0.60$$

$$\$19.80 \div \$0.60 = \underline{\underline{33 \text{ Double Chocolate muffins}}}$$

Ans: \_\_\_\_\_ (3m)

- (7) Channel sold some keychains over a period of time. Each day, he sells  $(a + 1)$  more keychains than the day before. He sold 25 keychains on the 1<sup>st</sup> day.
- (a) How many keychains did he sell on the 4<sup>th</sup> day? Give your answer in terms of  $a$  in the simplest form.
- (b) On which day would he have sold  $(77 + 52a)$  keychains?

(a) 1<sup>st</sup> day 25,  
2<sup>nd</sup> day =  $25 + a + 1 = 26 + a$   
3<sup>rd</sup> day =  $26 + a + a + 1 = 27 + 2a$   
4<sup>th</sup> day =  $27 + 2a + a + 1 = \underline{\underline{(3a + 28) \text{ keychains}}}$

(b)  $25 + 52 \times (a + 1) = 25 + 52a + 52 = 77 + 52a$   
Day 53

Ans: (a) \_\_\_\_\_ (1m)

(b) \_\_\_\_\_ (2m)

- (8) The length of a rectangle is increased by 35% and its breath is increased by 40%. What was the percentage increase in area?

$$1.35 \times 1.4 = 1.89$$

$$1.89 - 1 = 0.89$$

$$0.89 \times 100\% = \underline{\underline{89\%}}$$

Ans: \_\_\_\_\_ (3m)



(9) The first 15 numbers of a pattern are given below.

8, 2, 6, 3, 8, 2, 6, 3, 8, 2, 6, 3, 8, 2, 6, ...

- (a) What is the 579th number?  
(b) What is the sum of the first 577 numbers?

(a) The pattern repeats after every 8, 2, 6, 3.

Number of numerals in each set = 4

$$\begin{aligned}\text{Number of sets} &= 579 \div 4 \\ &= 144 \text{ R } 3\end{aligned}$$

3rd number in the set = 6

579th number = 6 (Ans)

- (b) Number of sets =  $577 \div 4$   
 $= 144 \text{ R } 1$

1st number in the set = 8

577th number = 8

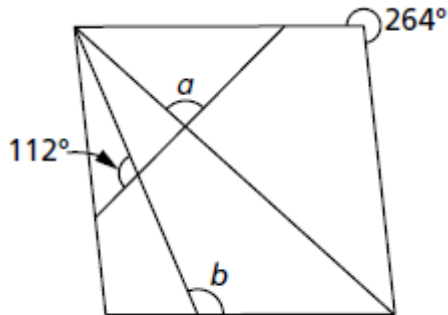
$$\begin{aligned}\text{Sum of each set} &= 8 + 2 + 6 + 3 \\ &= 19\end{aligned}$$

$$\begin{aligned}\text{Sum of the first 577 numbers} &= 144 \times 19 + 8 \\ &= 2744 \text{ (Ans)}\end{aligned}$$

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

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

- (10) The diagram below is a rhombus divided by 3 straight lines into 6 parts. Find the sum of  $\angle a + \angle b$



$$360^\circ - 264 = 96^\circ$$

$\angle x = (180^\circ - 96^\circ) \div 2 = 42^\circ$  (base angles in an isosceles triangle)

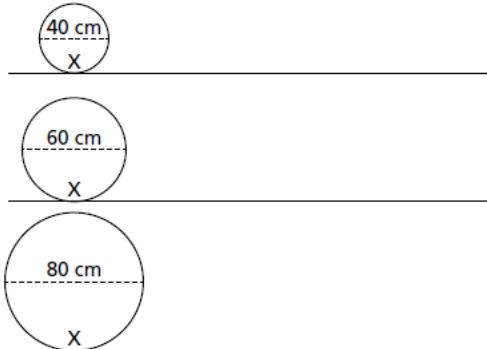
$$\angle x = \angle y = 42^\circ$$

$\angle w = 112^\circ$  (vertically opposite angles)

$$\angle a + \angle b = 360^\circ - 42^\circ - 112^\circ = \underline{\underline{206^\circ \text{ (Angles in a quadrilateral)}}}$$

Ans: \_\_\_\_\_ (3m)

- (11) Three circular wheel of diameter 40cm, 60cm and 80cm respectively are placed along identical path as shown in the diagram. They were pushed and started to roll at the same time. What is the total distance covered by the 3 wheels when the spot marked 'x' on the three wheels next touched the path at the same time? Give your answer to one decimal place in metres. Let  $\pi = 3.14$ .



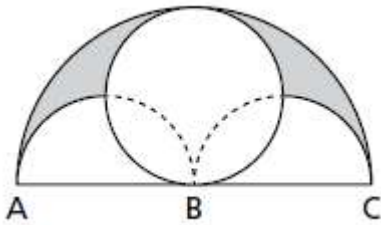
$$\text{L.C.M of } 40, 60 \text{ and } 80 = 240$$

$$3 \times 3.14 \times 240 \text{ cm} = 2260.8 \text{ cm}$$

$$= \underline{\underline{22.6 \text{ m (1 decimal place)}}}$$

Ans: \_\_\_\_\_ (3)

- (12) The figure below is made up of 3 semi-circles and a circle. B is the centre of the large semi-circle and AC is 46 cm. Find the area of the shaded part. Express your answer in 2 decimal places. (Take  $\pi = 3.14$ )



$$\begin{aligned} \text{Radius of the large semicircle} &= 46 \text{ cm} \div 2 \\ &= 23 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{Area of the large semicircle} \\ &= \frac{1}{2} \times 3.14 \times 23 \text{ cm} \times 23 \text{ cm} \\ &= 830.53 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Radius of the small circle} &= 23 \text{ cm} \div 2 \\ &= 11.5 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{Area of the small circle} \\ &= 3.14 \times 11.5 \text{ cm} \times 11.5 \text{ cm} \\ &= 415.265 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of the small quadrant} \\ &= \frac{1}{4} \times 415.265 \text{ cm}^2 \\ &= 103.81625 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of the small triangle} \\ &= \frac{1}{2} \times 11.5 \text{ cm} \times 11.5 \text{ cm} \\ &= 66.125 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of 1 overlapped part} \\ &= (103.81625 \text{ cm}^2 - 66.125 \text{ cm}^2) \times 2 \\ &= 75.3825 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} &830.53 \text{ cm}^2 - 415.265 \text{ cm}^2 - 415.265 \text{ cm}^2 \\ &+ 75.3825 \text{ cm}^2 + 75.3825 \text{ cm}^2 \\ &= 150.765 \text{ cm}^2 \\ &= 150.77 \text{ cm}^2 \text{ (2 decimal places)} \end{aligned}$$

The area of the shaded part is **150.77 cm<sup>2</sup>**.

Ans: \_\_\_\_\_(4m)

- (13) An empty tank was filled with water with taps A and B. Tap A can fill the tank in 9 minutes while Tap B can fill the tank in 5 minutes.
- (a) With both Tap A and B turned on, what fraction of the tank will be filled in 1 minute?
- (b) Starting with an empty tank, Tap A was turned on for 2 minutes before Tap B was turned on. How long in total would it take to fill the tank to its brim? Give your answers in minutes.

$$(a) \frac{1}{5} + \frac{1}{9} = \frac{14}{45}$$

$$(b) \frac{1}{9} \times 2 = \frac{2}{9}$$

$$1 - \frac{2}{9} = \frac{7}{9}$$

$$\frac{7}{9} \div \frac{14}{45} = 2.5 \text{ minutes}$$

$$2.5 + 2 = \underline{\underline{4.5 \text{ minutes}}}$$

Ans: (a) \_\_\_\_\_ (1m)

(b) \_\_\_\_\_ (3m)

- (14) At a sports equipment shop, basketballs are sold at 3 for \$80, tennis balls are sold at 4 for \$30. The Physical Education (PE) department of a school bought an equal number of basketballs and tennis balls and spent \$690 more on the basketballs than on the tennis balls. How many basketballs did the PE department buy?

L.C.M of 3 and 4 = 12

12 basketballs  $\rightarrow$   $\$80 \times 4 = \$320$

12 tennis balls  $\rightarrow$   $\$30 \times 3 = \$90$

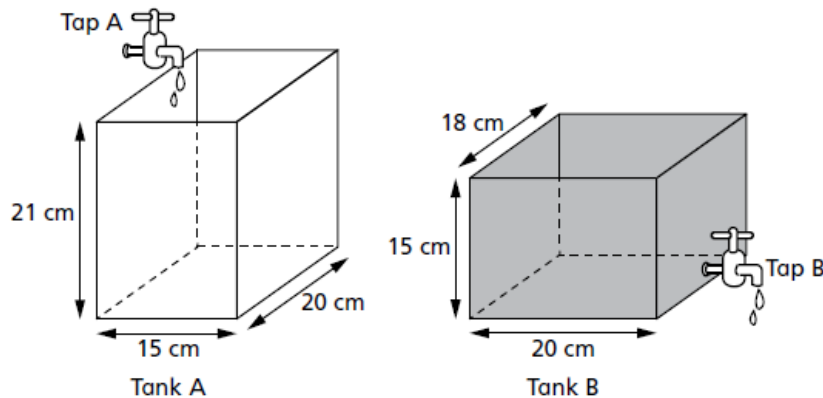
Difference  $\rightarrow$   $\$320 - \$90 = \$230$

$\$690 \div \$230 = 3$

$3 \times 12 = \underline{\underline{36 \text{ basketballs}}}$

Ans: \_\_\_\_\_ (4)

- (15) There are 2 tanks of different dimensions. Tank A is 15cm by 20cm by 21cm and is empty. Tap A which flows at a rate of 0.6 litres per minute was attached to it. Tank B is 20cm by 18cm by 15cm and is filled to its brim. Tap B which drains water at a rate of 1.08 litres per minute and was attached to Tank B. Both taps are turned on at the same time. After some time, the heights of the water level in both tanks became the same.
- (a) Find the time taken for the heights of the water level to be the same in both tanks.  
 (b) Find the height of the water level at that point of time.



$$0.6 \text{ l} = 600 \text{ cm}^3$$

Increase in height of water level in tank A in 1 min

$$= 600 \text{ cm}^3 \div 15 \text{ cm} \div 20 \text{ cm}$$

$$= 2 \text{ cm}$$

$$1.08 \text{ l} = 1080 \text{ cm}^3$$

Decrease in height of water level in tank B in 1 min

$$= 1080 \text{ cm}^3 \div 20 \text{ cm} \div 18 \text{ cm}$$

$$= 3 \text{ cm}$$

Total change in height of water level in both tanks in 1 min = 2 cm + 3 cm

$$= 5 \text{ cm}$$

$$15 \text{ cm} \div 5 \text{ cm} = 3$$

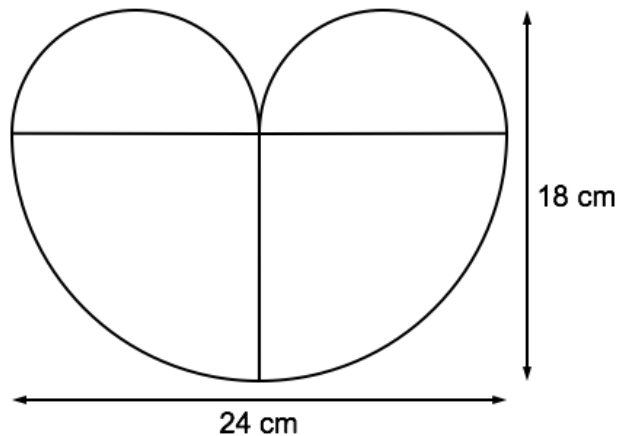
Ans: 3 min

(b)  $3 \times 2 = \underline{6 \text{ cm}}$

Ans: (a) \_\_\_\_\_ (3m)

(b) \_\_\_\_\_ (2m)

16. Sarah needs to cut 100 pieces of heart shape cut-outs using the dimensions shown in the figure. Each cut-out is made up of 2 identical semicircles and 2 identical quadrants.



- (a) What is the total area of all the heart shape cut-outs?  
 (b) Coloured papers are sold in dimensions of 1 m by 1 m. What is the minimum number of pieces of coloured papers Sarah needs to buy?

Take  $\pi = 3.14$ .

(a) Radius of each quadrant =  $24 \div 2$   
 = 12 cm

Radius of each semicircle =  $18 - 12$   
 = 6 cm

Area of each quadrant =  $\frac{1}{4} \times 3.14 \times 12 \times 12$   
 = 113.04 cm<sup>2</sup>

Area of each semicircle =  $\frac{1}{2} \times 3.14 \times 6 \times 6$   
 = 56.52 cm<sup>2</sup>

Area of all the heart shape cut-outs =  $100 \times (2 \times 113.04 + 2 \times 56.52)$

$$= 33\,912 \text{ cm}^2 \text{ (Ans)}$$

(b)  $1 \text{ m} = 100 \text{ cm}$

$$100 \div 18 = 5 \text{ R } 10 \text{ cm}$$

$$100 \div 24 = 4 \text{ R } 4 \text{ cm}$$

Number of cut-outs from each coloured paper

$$= 5 \times 4$$

$$= 20$$

Minimum number of coloured paper Sarah needs to buy

$$= 100 \div 20$$

$$= 5 \text{ (Ans)}$$

Ans: (a) \_\_\_\_\_ (3m)

(b) \_\_\_\_\_ (2m)

10. Shannon received \$500 salary for her part-time job every month. In 2018, her salary increased by 15%. In January 2018, she increased her spending by 100% and decreased her savings by 25%.

- (a) What was Shannon's salary in 2018?  
(b) What was her monthly spending in 2017?

(a) Shannon's salary in 2018 =  $115\% \times \$500$

$$= \frac{115}{100} \times \$500$$

$$= \$575 \text{ (Ans)}$$

(b)

	2017	:	2018
Spending	100%	:	200%
	1 unit	:	2 units
Savings	100%	:	75%
	4 parts	:	3 parts

$$1 \text{ unit} + 4 \text{ parts} = \$500 \Rightarrow 3 \text{ units} + 12 \text{ parts} = \$1500$$

$$2 \text{ units} + 3 \text{ parts} = \$575 \Rightarrow 8 \text{ units} + 12 \text{ parts} = \$2300$$

$$(8 - 3 =) 5 \text{ units} = \$2300 - \$1500$$

$$= \$800$$

$$1 \text{ unit} = \$800 \div 5$$

$$= \$160$$

$$\text{Monthly spending in 2017} = \$160 \text{ (Ans)}$$

Ans: (a) \_\_\_\_\_ (1m)

(b) \_\_\_\_\_ (4m)