

1. The circumference of circle B is 90% of the circumference of circle A.

(a) Find the ratio of the area of circle A to the area of circle B.

	A	Scale Factor	B
Circumference	10	$\rightarrow \times 0.9 \rightarrow$	9
Area	100	$\rightarrow \times 0.9^2 \rightarrow$	81

①

$$\begin{aligned} \text{Area of A} &: \text{Area of B} \\ = & 100 : 81 \end{aligned}$$

①

$$100 : 81$$

(2)

Square E has sides of length e cm.

Square F has sides of length f cm.

The area of square E is 44% greater than the area of square F.

(b) Work out the ratio $e:f$

	F	Scale Factor	E
Length	10	$\rightarrow \times \sqrt{1.44} \rightarrow$	12 ①
Area	100	$\rightarrow \times 1.44 \rightarrow$	144

$$\begin{aligned} e & : f \\ \text{length of E} & : \text{length of F} \\ = & 12 : 10 \\ = & 6 : 5 \end{aligned}$$

①

$$6 : 5$$

(2)

(Total for Question is 4 marks)

2. Write 37 cm^3 in mm^3

$$\begin{array}{l}
 1 \text{ cm} = 10 \text{ mm} \\
 1^3 \text{ cm}^3 = 10^3 \text{ mm}^3 \\
 1 \text{ cm}^3 = 1000 \text{ mm}^3
 \end{array}
 \left. \vphantom{\begin{array}{l} 1 \text{ cm} = 10 \text{ mm} \\ 1^3 \text{ cm}^3 = 10^3 \text{ mm}^3 \\ 1 \text{ cm}^3 = 1000 \text{ mm}^3 \end{array}} \right\} \times 37 \left\{ \begin{array}{l} 1 \text{ cm}^3 = 1000 \text{ mm}^3 \\ 37 \text{ cm}^3 = 37000 \text{ mm}^3 \end{array} \right. \times 37$$

..... 37000 mm^3

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

$$\begin{array}{cc}
 14-13 & 48-30 \\
 \downarrow & \downarrow \\
 1 & 18
 \end{array}$$

Between 13:30 and 14:48 there is 1 hour 18 minutes

Convert everything to hours

$$1 \text{ hour } 18 \text{ minutes} \rightarrow 1 \text{ hour} + \frac{18}{60} \text{ hours} \rightarrow 1 + \frac{18}{60} \text{ hours} \rightarrow 1.3 \text{ hours}$$

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

$$\text{Speed} = \frac{65}{1.3} = 50 \text{ mph}$$

..... 50

3. A water tank is empty.
Anil needs to fill the tank with 2400 litres of water.

Company A supplies water at a rate of 8 litres in 1 minute 40 seconds.

Company B supplies water at a rate of 2.2 gallons per minute.

1 gallon = 4.54 litres

Company A would take more time to fill the tank than Company B would take to fill the tank.

How much more time?

Give your answer in minutes correct to the nearest minute.

COMPANY A	COMPANY B.
<p>1 min 40 seconds</p> <p>= $1 + \left(\frac{40}{60}\right)$ minutes ①</p> <p style="margin-left: 40px;">↙ because there are 60 seconds in 1 minute.</p> <p>= $\frac{5}{3}$ mins.</p> <p style="margin-left: 40px;">$\times 300$ ↙ $8\text{ l} = \frac{5}{3}$ mins. ↘ $\times 300$</p> <p>$2400\text{ l} = \underline{500\text{ mins.}}$ ①</p> <p>Company A takes 500 mins</p>	<p>$\times 2.2$ ↙ 1 gallon = 4.54 l ↘ $\times 2.2$</p> <p>2.2 gallons = 9.988 l</p> <p>$\times \frac{2400}{9.988}$ ↙ 9.988 l = 1 min ↘ $\times \frac{2400}{9.988}$</p> <p>$2400\text{ l} \approx \underline{240\text{ mins}}$</p> <p>Company B takes ≈ 240 mins ①</p> <p style="text-align: center;">①</p> <p style="text-align: center;">260</p> <p style="text-align: right;">..... minutes</p>

$500 - 240 = 260$

(Total for Question is 4 marks)

∴ A takes 260 mins longer than B.