

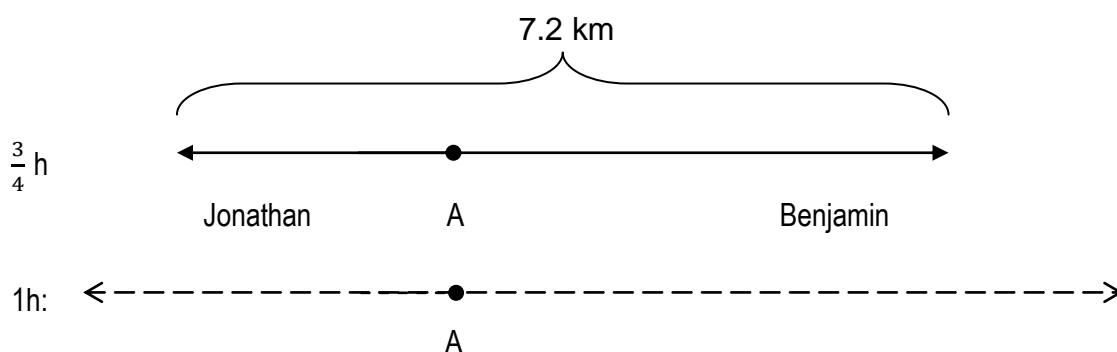
Questions from Anushuya

1. Jonathan and Benjamin started brisk walking from Point A but in opposite direction. After walking for $\frac{3}{4}$ h, they were 7.2 km apart. Jonathan's speed was 1.4 km/h slower than Benjamin.

(a) Find Jonathan's speed.

(b) If Benjamin continued to brisk walk for another $\frac{1}{2}$ h, find the total distance covered by him. Give your answer correct to 1 decimal place.

Suggested solution:



Distance apart in $\frac{3}{4}$ h = Sum of distance covered in $\frac{3}{4}$ h

Distance apart in 1 h = Sum of distance covered by Jonathan and Benjamin in 1 h

$$\frac{3}{4} \text{ h} \rightarrow 7.2 \text{ km}$$

$$1 \text{ h} \rightarrow 7.2 \div 3 \times 4 = 9.6 \text{ km (Sum of distance covered in 1 h)}$$

Since Jonathan covers 1.4 km less than Benjamin in 1 h,

$$\text{Jonathan's speed} \rightarrow (9.6 \text{ km} - 1.4 \text{ km}) \div 2 = 4.1 \text{ km (in 1 h)}$$

Ans: (a) Jonathan's speed was 4.1 km/h.

$$\text{Benjamin's speed} \rightarrow 4.1 \text{ km/h} + 1.4 \text{ km/h} = 5.5 \text{ km/h}$$

$$\text{Total time Benjamin walked} \rightarrow \frac{3}{4} \text{ h} + \frac{1}{2} \text{ h} = 1\frac{1}{4} \text{ h}$$

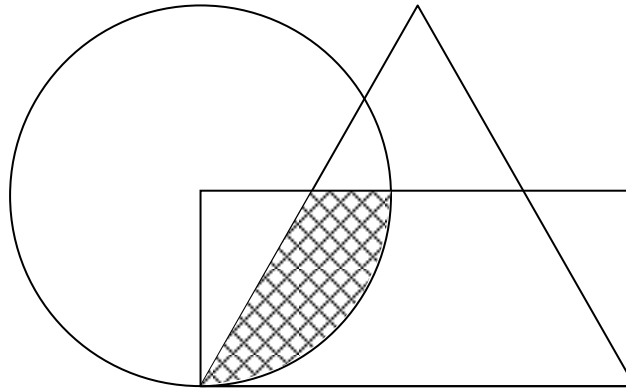
$$\text{Distance covered} \rightarrow \text{Speed} \times \text{Time} = 5.5 \text{ km/h} \times 1\frac{1}{4} \text{ h} = 6.875 \approx 6.9 \text{ km/h (1 d.p.)}$$

Ans: (b) The total distance covered by Benjamin was 6.9 km.

2. The figure below consists of a circle, a rectangle and an isosceles triangle overlapping one another. The ratio of the area of the circle to the area of the triangle to the area of the rectangle is 7 : 5 : 3.

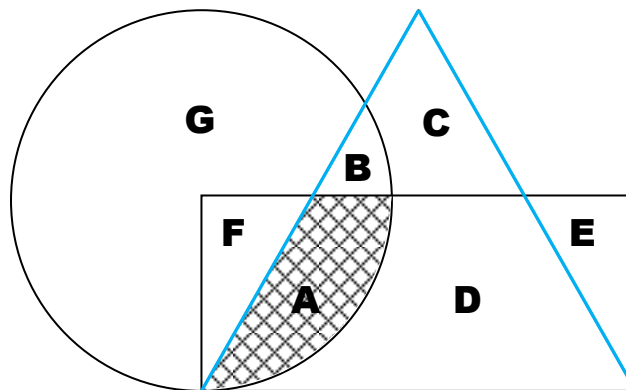
$\frac{1}{4}$ of the triangle is shaded. The overlapped area of the circle and the triangle is $\frac{1}{4}$ the area of the circle.

The overlapped area of the circle and the rectangle is $\frac{1}{4}$ the area of the circle. What percentage of the figure is unshaded? Give your answer in 2 decimal places.



Suggested solution:

Consider the regions A to G in the figure shown below:



Based on information given in the question, we have

Circle's area	:	Triangle's area	:	Rectangle's area	A	:	B + C + D	
A + B + F + G	:	A + B + C + D	:	A + D + E + F	1 × 5	:	3 × 5	4 units
7 × 4	:	5 × 4	:	3 × 4	5	:	15	
= 28	:	20	:	12				

Triangle's area is 5 units → Lowest common multiple of 4 and 5 = 20

A + F : B + G

1 : 3
= 7 : 21

Since A represents an area of 5 units, F = 2 units

The triangle is isosceles. By symmetry, E and F have the same area. → E = 2 units

$$A + B : F + G$$

$$1 : 3$$

$$= 7 : 21$$

Since $F = 2$ units, $G \rightarrow 21 - 2 = 19$ units

Entire figure's area $\rightarrow A + B + C + D + E + F + G = 20 + 2 + 2 + 19 = 43$ units

Percentage of figure unshaded $\rightarrow \frac{B+C+D+E+F+G}{43} \times 100\% = \frac{38}{43} \times 100\% \approx 88.37\%$ (2 d.p.)

Ans: 88.37% of the figure is unshaded.