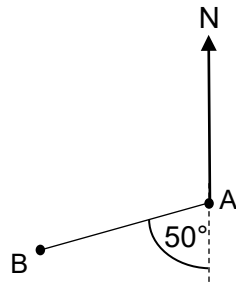


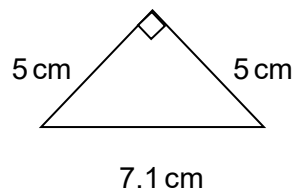
OCR 10 Mensuration (Foundation)

1. A driver is paid at a rate of £9.20 an hour. One week she earns £322.00.
How many hours did she work that week?
2. Calculate the circumference of a circle with diameter 4.5 cm.
3. Work out the bearing of B from A.



Not to scale

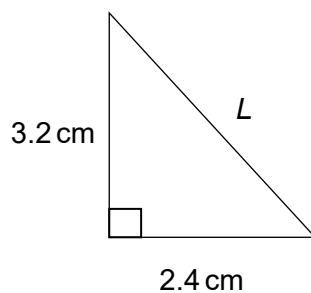
4. Calculate the area of this triangle.



Not to scale

5. $\sin x = 0.8$. Find x .

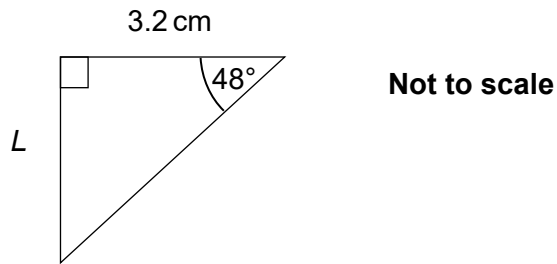
6. Calculate L .



Not to scale

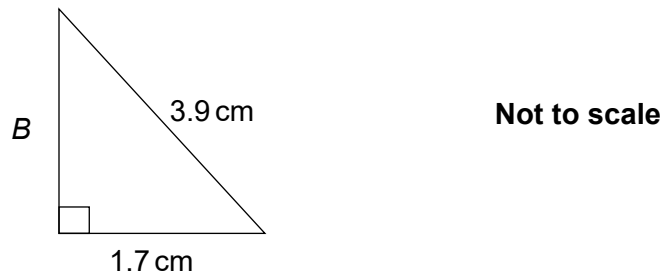
7. A map has a scale of 1 : 750.
A road is 600 m long. How long will it be on the map?
8. The volume V of a sphere is given by the formula $V = \frac{4}{3}\pi r^3$, where r is the sphere's radius.
Find the volume of a sphere with a radius of 12 cm.

9. Calculate
- L
- .



10. Calculate the surface area of a cuboid with side lengths 3.5 cm, 4 cm and 6.2 cm.

11. Fred uses Pythagoras' theorem to find
- B
- .



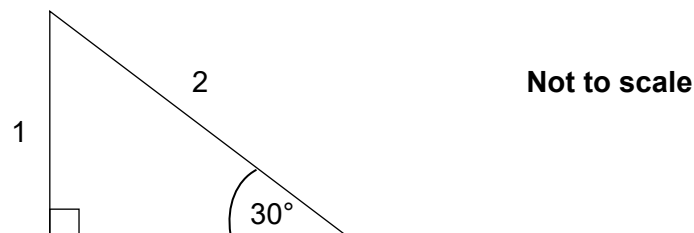
He writes: $B^2 = 3.9^2 + 1.7^2$

so $B^2 = 15.21 + 2.89 = 18.1$

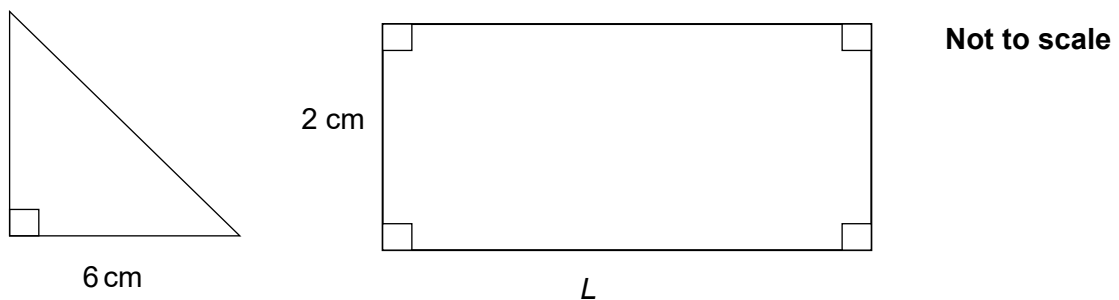
and $B = \sqrt{18.1} = 4.25$ cm to 2 decimal places.

Identify the mistake Fred has made and show how to find the correct answer.

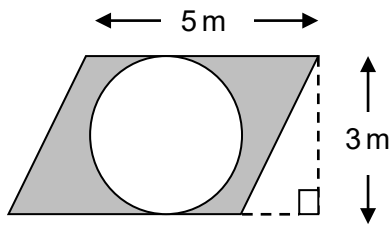
12. Using the diagram below, show that
- $\tan 30^\circ$
- is equal to
- $\frac{\sqrt{3}}{3}$
- .



13. The area of the isosceles triangle is twice the area of the rectangle.
-
- Show that the length,
- L
- , of the rectangle is 4.5 cm.

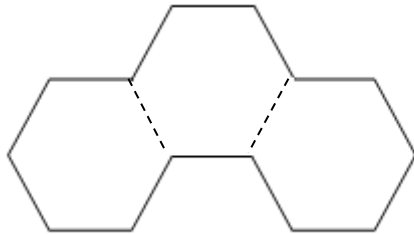


14. This shape is made of a parallelogram and a circle.
Show that the shaded area is $15 - 2.25\pi \text{ m}^2$.



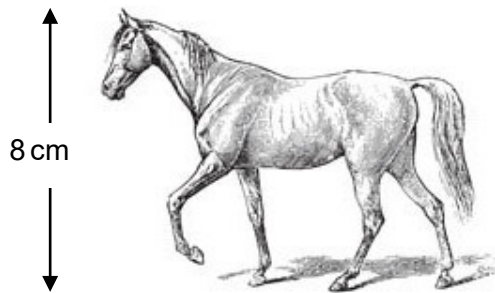
Not to scale

15. This shape is made from three regular hexagons joined together, each of side length 1.5 m.
Daljit calculates the perimeter of the shape to be $3 \times 6 \times 1.5 = 27 \text{ m}$.
Explain what Daljit has done wrong.



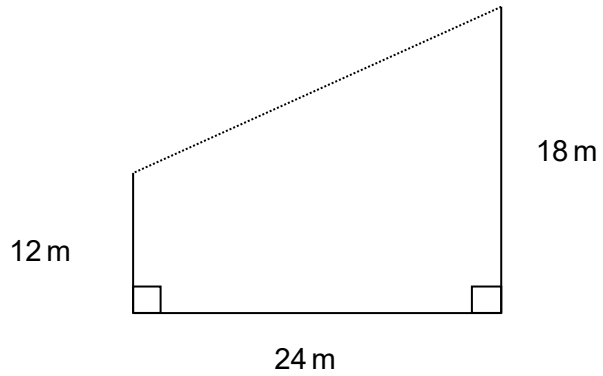
Not to scale

16. Each wheel on a bicycle has a diameter of 0.622 m.
Write an expression for the number of turns each wheel will make if the bike travels $x \text{ m}$.
17. Anne makes a model of her horse, shown below.
She has used a scale of 1 : 19. How tall is the real horse in metres?



18. The density of water is 1000 kg per m^3 . A water tank has a capacity of 8 m^3 .
Calculate the weight of water in the tank when it is half full.
19. The minute hand on a tower clock is 4.2 m long.
How far in metres does the end of the minute hand travel in 5 minutes?

20. Two vertical posts of height 12 m and height 18 m are erected 24 m apart. Find the distance between the top of the two posts.



Not to scale

Answers

1. 35

2. 14.1 cm

3. 230°

4. 12.5 cm^2

5. 53.1°

6. $3.2^2 + 2.4^2 = 16$

$\sqrt{16} = 4 \text{ cm}$

7. $\frac{600}{750} = 0.8 \text{ m or } 80 \text{ cm}$

8. $V = \frac{4}{3} \times \pi \times 12^3 = 2304\pi \text{ cm}^3 \text{ or } 7238 \text{ cm}^3$

9. $3.2 \times \tan 48^\circ = 3.6 \text{ cm}$

10. $2 \times ((3.5 \times 4) + (4 \times 6.2) + (6.2 \times 3.5))$
 $= 121 \text{ cm}^2$

11. $B^2 = 3.9^2 - 1.7^2$

Correct answer is 3.51 cm to 2 dp

12. Adjacent side $= \sqrt{2^2 - 1^2} = \sqrt{3}$

$\tan 30^\circ = \frac{o}{a} = \frac{1}{\sqrt{3}}$

Rationalising the denominator gives $\frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$.

13. Area of triangle $= \frac{1}{2} \times 6 \times 6 = 18 \text{ cm}^2$.

Area of rectangle $= \frac{1}{2} \times \text{area of triangle} = \frac{1}{2} \times 18 = 9 \text{ cm}^2$.

$L = 9 \div 2 = 4.5 \text{ cm}$.

14. Area of parallelogram $= 5 \times 3 = 15 \text{ m}^2$

Area of circle $= \pi \times 1.5 \times 1.5 = 2.25\pi \text{ m}^2$

Shaded area $= 15 - 2.25\pi \text{ m}^2$

15. Daljit has included the sides inside the shape. The correct answer is 21 m.

16. $\frac{x}{0.622 \times \pi}$

17. $8 \times 19 = 152 \text{ cm} = 1.52 \text{ m}$

18. $\text{Weight} = 8 \times \frac{1}{2} \times 1000 = 4000 \text{ kg}$

19. $\frac{5}{60} \times 2 \times \pi \times 4.2 = 0.7\pi \text{ m or } 2.2 \text{ m}$

20. $24^2 + 6^2 = 612$
 $\sqrt{612} = 24.7 \text{ m}$

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AO1	1	Use simple compound units			
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AO1	3	Work with bearings			
AO1	4	Know and apply the formula for area of a triangle			
AO1	5	Know and apply trigonometric ratios in a right-angled triangle			
AO1	6	Know and apply Pythagoras' theorem			
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AO1	8	Calculate volume of sphere			
AO1	9	Know and apply trigonometric ratios to find a length			
AO1	10	Calculate surface area of a cuboid			
AO2	11	Know and apply Pythagoras' theorem			
AO2	12	Know and apply Pythagoras' theorem and trigonometric ratios			
AO2	13	Find a dimension given the area			
AO2	14	Find area of composite shapes			
AO2	15	Find perimeter of composite shapes			
AO3	16	Use standard units of measurement in algebraic context			
AO3	17	Interpret a scale drawing			
AO3	18	Apply formula: density = mass ÷ volume			
AO3	19	Calculate a length of a sector given angle and radius			
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