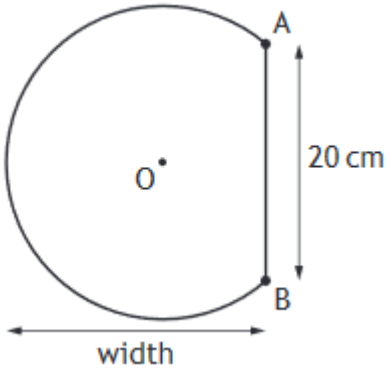
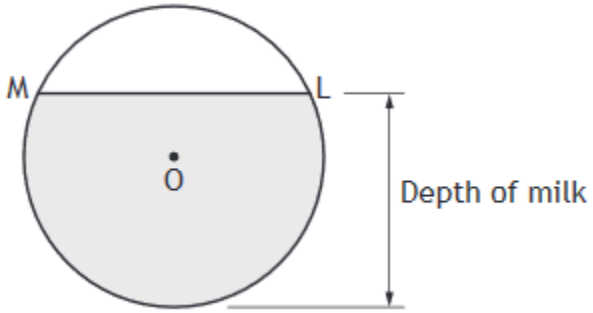
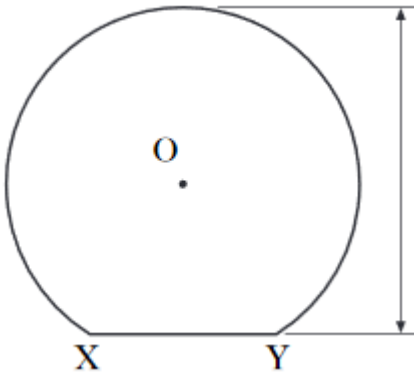
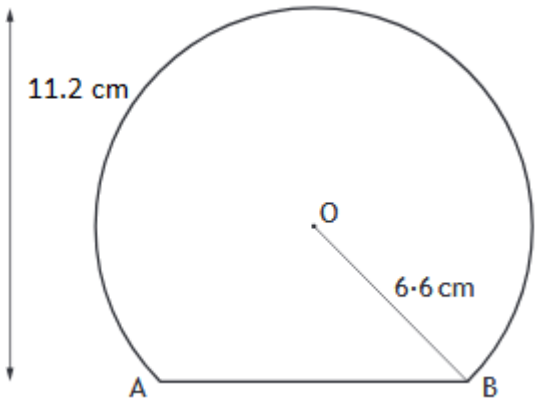
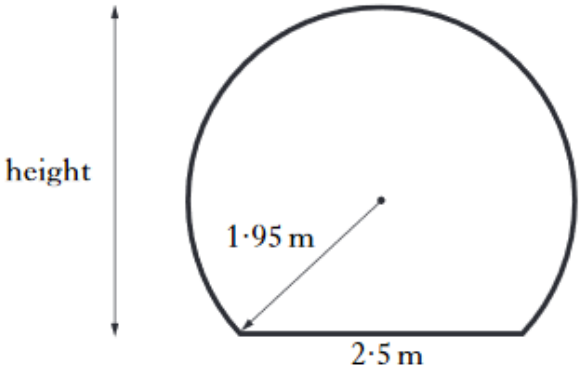
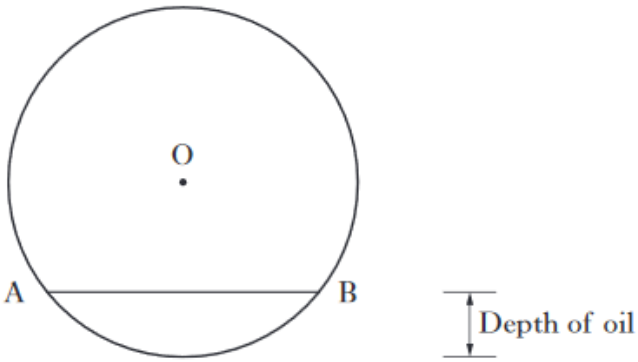
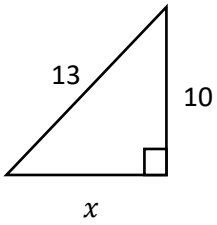
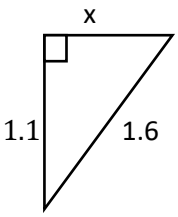
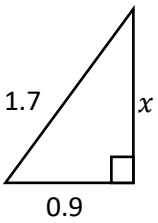
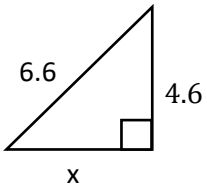
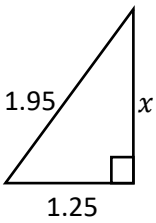
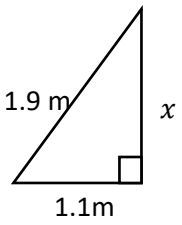
	Pythagoras in the circle	
1	The shape shown is part of a circle with a centre O. The circle has radius of 13 centimetres. AB is a chord of length 20 centimetres. Calculate the width of the shape.  	4
2	The diagram shows the circular cross-section of a milk tank.  • The radius of the circle, centre O, is 1.6 metres • The depth of milk in the tank is 2.7 metres. Calculate the width of the surface of the milk, represented by chord ML.	4
3	The diagram shows a cross-section of a tunnel. This consists of part of a circle with a centre O and a horizontal base. The circle has radius of 1.7 metres. Chord XY is 1.8 metres. Calculate the height of the tunnel.  	4

4	 A perfume bottle has a label in the shape of part of a circle. The centre of the circle is O. The circle has radius of 6.6 centimetres. The height of the label is 11.2 centimetres. Calculate the width of chord AB.	4
5	Shown is a cross-section of a tunnel. This consists of part of a circle with a horizontal base.  The circle has radius of 1.92 metres. The width of the base is 2.5 metres. Calculate the height of the tunnel.	4
6	A tanker delivers oil to garages. The tank has a circular cross section as shown in the diagram below.  The radius of the circle, centre O, is 1.9 metres. The width of the surface of the oil is represented by AB which is 2.2 metres. Calculate the depth of oil in the tanker.	4
	24 marks	

	Pythagoras in the circle – Answers	
1	Mark 1 Recognise right angled triangle  Mark 2 consistent statement of Pythagoras $x^2 = 13^2 - 10^2$ Mark 3 calculate a value for the missing side $x = 8.3$ Mark 4 calculate the width $13 + 8.3 = \mathbf{21.3\ cm}$ 2 marks can be given for $x^2 = 13^2 + 10^2, x = 16.4$ so width is $29.4\ cm$ 2 marks can be given for $x^2 = 20^2 - 13^2, x = 15.2$ so width is $28.2\ cm$	4
2	Mark 1 Recognise right angled triangle  Mark 2 consistent statement of Pythagoras $x^2 = 1.6^2 - 1.1^2$ Mark 3 calculate a value for the missing side $x = 1.16$ Mark 4 Calculate the width $2 \times 1.16 = 2.32\ m$ 2 marks can be given for $x^2 = 1.6^2 + 1.1^2, x = 1.94,$ so width is $2 \times 1.94 = 3.88\ m$ 2 marks can be given for $x^2 = 2.7^2 - 1.6^2, x = 2.17,$ so width is $2 \times 2.17 = 4.34\ m$	4
3	Mark 1 Recognise right angled triangle  Mark 2 consistent statement of Pythagoras $x^2 = 1.7^2 - 0.9^2$ Mark 3 calculate a value for the missing side $x = 1.44$ Mark 4 Calculate the height $1.7 + 1.44 = 3.14\ m$ 2 marks can be given for $x^2 = 1.7^2 + 0.9^2, x = 1.9,$ so height is $1.7 + 1.9 = 3.6\ m$ 2 marks can be given for $x^2 = 1.8^2 - 1.7^2, x = 0.6,$ so height is $1.7 + 0.6 = 2.3\ m$	4

4	Mark 1 Recognise right angled triangle  Mark 2 consistent statement of Pythagoras $x^2 = 6.6^2 - 4.6^2$ Mark 3 calculate a value for the missing side $x = 4.7$ Mark 4 Calculate the width $2 \times 4.7 = 9.4\ cm$ 2 marks can be given for $x^2 = 6.6^2 + 4.6^2, x = 8$, so width is $2 \times 8 = 16\ cm$ 2 marks can be given for $x^2 = 11.2^2 - 6.6^2, x = 9$, so width is $2 \times 9 = 18\ cm$	4
5	Mark 1 Recognise right angled triangle  Mark 2 consistent statement of Pythagoras $x^2 = 1.95^2 - 1.25^2$ Mark 3 calculate a value for the missing side $x = 1.5$ Mark 4 Calculate the height $1.95 + 1.5 = 3.45\ m$ 2 marks can be given for $x^2 = 1.95^2 + 1.25^2, x = 2.3$, so height is $1.95 + 2.3 = 4.25\ m$ 2 marks can be given for $x^2 = 2.5^2 - 1.95^2, x = 1.6$, so height is $1.95 + 1.6 = 3.55\ m$	4
6	Mark 1 Recognise right angled triangle  Mark 2 consistent statement of Pythagoras $x^2 = 1.9^2 - 1.1^2$ Mark 3 calculate a value for the missing side $x = 1.5$ Mark 4 Calculate the depth $1.9 - 1.5 = \mathbf{0.4\ m}$ 2 marks can be given for $x^2 = 1.9^2 + 1.1^2, x = 16.4$ so depth is $1.9 - 2.2 = -0.3\ m$ 2 marks can be given for $x^2 = 2.2^2 - 1.9^2, x = 1.1$ so depth is $1.9 - 1.1 = 0.8\ m$	4