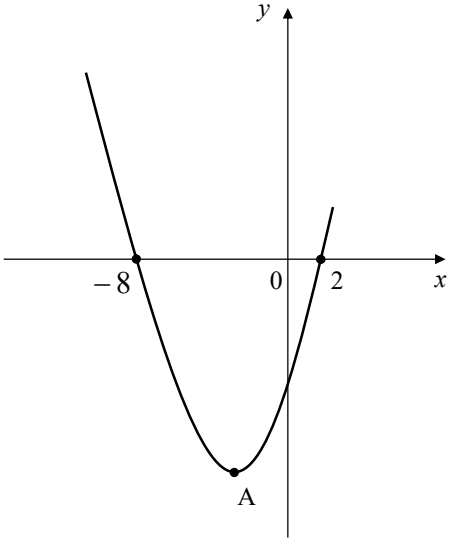
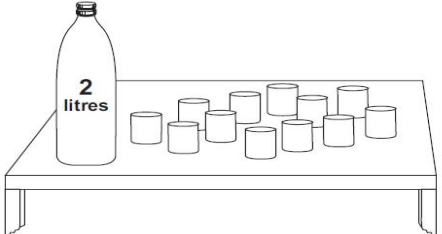
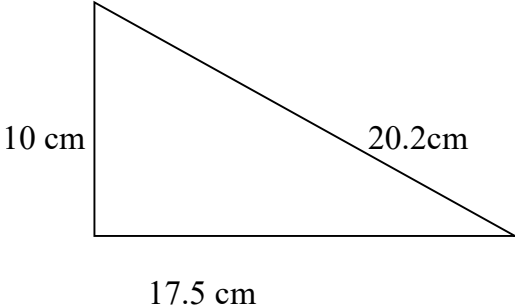
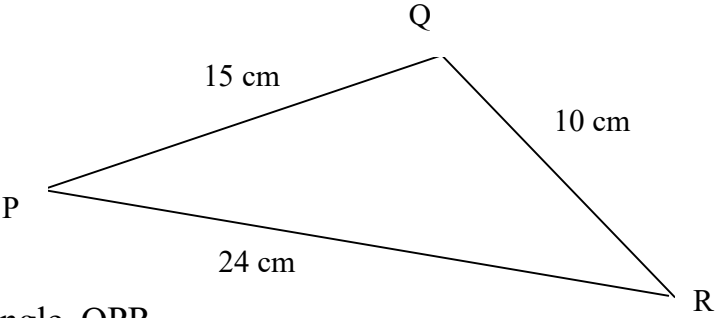
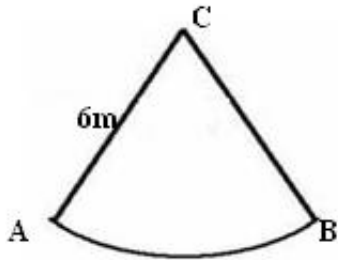


	Nat 5 Prelim – Non-Calculator	20
1.	Evaluate $2\frac{1}{4} \div \frac{3}{8}$	2
2.	Multiply the brackets and simplify $4x - (x - 4)(2x + 1)$	3
3.	Find the equation of the straight line through the points (0,-2) and (5,2)	3
4.	Factorise $2x^2 + 5x - 3$	2
5.	Solve, algebraically , the system of equations $3x + 2y = 13$ $x - y = 1$	3
6.	Determine the nature of the roots of the equation $3x^2 + 6x - 3$	2
7.	For the straight line with equation $2y = 3x + 4$ (a) Write down the gradient of this line (b) State the coordinates of the y-intercept	2 1
8.	The diagram shows part of the graph $y = x^2 + 6x - 16$, State the coordinates of the turning point A	 2

	Nat 5 Prelim Revision – Calculator	30
1.	<p>It is estimated that an iceberg weighs 84 000 tonnes. As the iceberg moves into warmer waters, its weight decreases by 25% each day. What will the iceberg weigh after 3 days in the warmer water? Give your answer correct to three significant figures.</p>	4
2.	<p>Lemonade is to be poured from a 2 litre bottle into glasses. Each glass is in the shape of a cylinder of radius 3 cm and height 8 cm.</p> <p>How many full glasses can be poured from the bottle?</p>	4
		
3.	<p>A triangle has the dimensions shown below. Is this triangle right-angled?</p> 	3
4.	<p>Triangle PQR is shown below</p>  <p>Calculate the size of angle QPR</p>	3
5.	<p>Solve the quadratic equation $x^2 - 4x - 6 = 0$ Give your answers correct to 1 decimal place.</p>	3

6. The boat on a carnival ride travels along an arc of a circle, centre C.



The boat is attached to C by a rod which is 6 metres long.

The rod swings from position CA to position CB.

The length of the arc AB is 7 metres.

Find the angle through which the rod swings from position A to position B

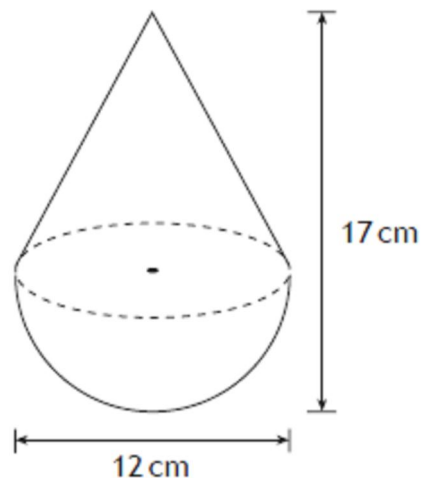
4

7. A child's toy is in the shape of a hemisphere with a cone on top, as shown here.

The toy is 12 centimetres wide and 17 centimetres high.

Calculate the volume of the toy.

Give your answer correct to 2 significant figures.

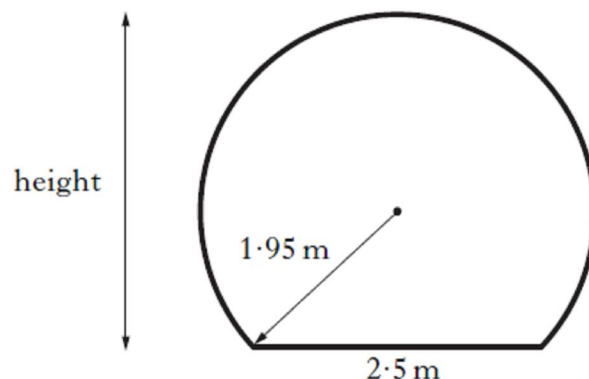


5

9. This diagram shows the circular cross-section of a tunnel with a horizontal floor.

The floor is 2.5 metres.
The radius of the circle is 1.95 metres.

Find the height of the tunnel



4

Answers

Paper 1

- 6
- $-2x^2 + 11x + 4$
- $m = 4/5$, $y = 4/5x - 2$
- $(2x - 1)(x + 3)$
- $x = 3$, $y = 2$
- $b^2 - 4ac = (6^2) - 4 \times 3 \times (-3) = 72$
 $72 > 0$, 2 distinct real roots
- (a) $y = 3/2x + 2$, $m = 3/2$
(b) (0,2)
- (-3, -25)

Paper 2

- $84000 \times 0.75^3 = 35437.50 = \frac{35400}{100}$
- $\pi \times 3^2 \times 8 = 72\pi = (226.19)$, $\frac{2000}{72\pi} (= 8.84)$,
answer rounds down to 8 glasses
- $20.2^2 = 408.04$, $10^2 + 17.5^2 = 406.25$
 $408.04 \neq 406.25$, $20.2^2 \neq 10^2 + 17.5^2$
So by the converse of Pythagoras this is not a right-angled triangle
- $\cos PQR = \frac{15^2 + 24^2 - 10^2}{2 \times 15 \times 24} = \frac{701}{720}$
 $PQR = 13^\circ$
- show full substitution into quadratic formula,
discriminant is $\sqrt{40}$, answer -1.2, 5.2
- $\frac{\text{angle}}{360} \times \pi \times 12 = 7$, angle is 66.8°
- Volume of a cone 414.690,
Volume of a hemisphere 452.389,
total volume $867.079 = 870\text{cm}^3$
- Establish a right-angled triangle
Use Pythagoras $x^2 = 1.95^2 - 1.25^2$,
 $x = 1.5$ m, height is 3.45m

Extra Practice

1.	Fractions	Q2 Pg 342	1.	Percentage inc/dec	Q7-9 Pg 331
2.	Expanding brackets	Q5 Pg 30 Q3 Pg 32	2.		
3.	Straight lines	Q2,3 Pg 98	3.	Cosine Rule	Q1 Pg 303
4.	Factorising	Q1 Pg 40	4.	Converse of Pythagoras	Q1,2 Pg 208
5.	Simultaneous equations	Q1 Pg 127	5.	Quadratic Formula	Q2 Pg 188
6.	Discriminant	Q1, Pg 201	6.	Sector angle	Q1,2 Pg 74
7.	Straight lines	Q1,2 Pg 108	7.	Volume	Q1,3 Pg 82
8.	Quadratic Graphs	Q3 Pg 172	8.	Perpendicular Bisectors	Q1 Pg 227