



National 4
Added Value
Specimen paper (not for assessment)
Unit Practice Paper

Added Value Unit

Candidate's Name: _____

Class : _____

The candidate should achieve at least half of the available points for operational skills and at least half of the available points for reasoning skills across the test as a whole.

Part	Question			
		Operational Skills	Reasoning Skills	
1	1			
	2			
	3			
	4			
	5			
2	1			
	2		#	
	3		#	
	4			
	5		#	
	6			
	7		#	
Total points of process and accuracy available		Total achieved	Total number of opportunities for reasoning skills	Total achieved
39			4	

Formulae List

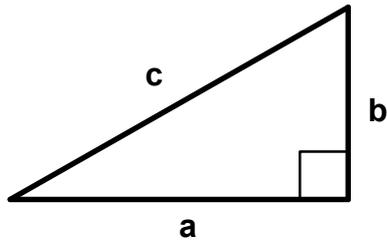
Circumference of a circle: $C = \pi d$

Area of a circle: $A = \pi r^2$

Curved surface area of a cylinder: $V = \pi r^2 h$

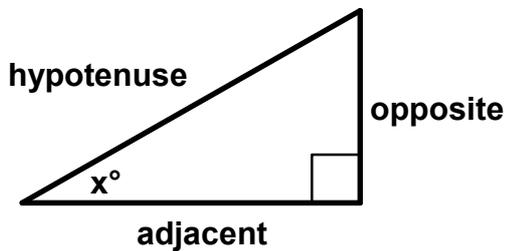
Volume of a prism: $V = Ah$

Theorem of Pythagoras:



$$a^2 + b^2 = c^2$$

Trigonometric ratios
in a right angled triangle:

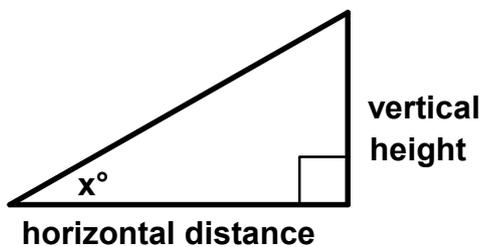


$$\tan x^\circ = \frac{\textit{opposite}}{\textit{adjacent}}$$

$$\sin x^\circ = \frac{\textit{opposite}}{\textit{hypotenuse}}$$

$$\cos x^\circ = \frac{\textit{adjacent}}{\textit{hypotenuse}}$$

Gradient:



$$\textit{Gradient} = \frac{\textit{vertical height}}{\textit{horizontal distance}}$$

4. To make a cake, a baker adds 2.65 kg of flour to 1.5 kg of butter. The baker uses 3.85 kg of the mix in his cake. How much of the mix is left over?
5. If one DVD costs £12.95, how much will it cost to buy 7 of these DVDs?

[End of Part 1 of the Test]

Mathematics Test - Part 2

Candidate's name: _____

Read carefully

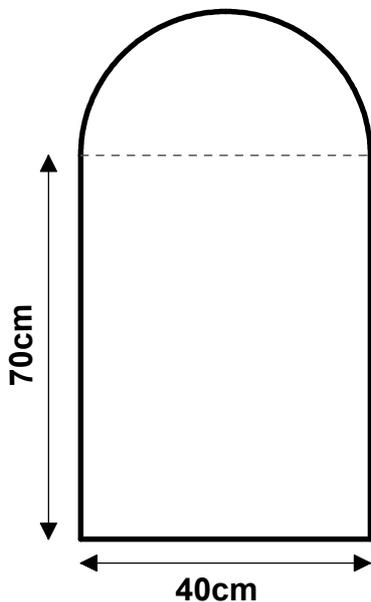
- ◆ Calculators may be used in Part 2.
- ◆ Attempt all the questions.
- ◆ Show appropriate working.
- ◆ You have approximately 40 minutes to complete Part 2.

1. Solve algebraically the equation:

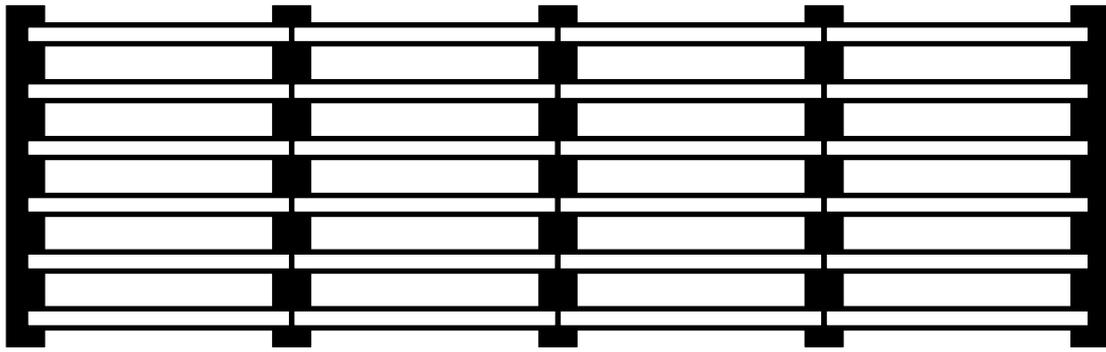
$$6x - 3 = 4x + 7$$

2. A work surface is made from a semi-circle and a rectangle as shown below.

Calculate the area of the work surface.



3. Scott is constructing a fence with posts and rails as shown below.



2 posts
6 rails

3 posts
12 rails

- (a) Complete the following table.

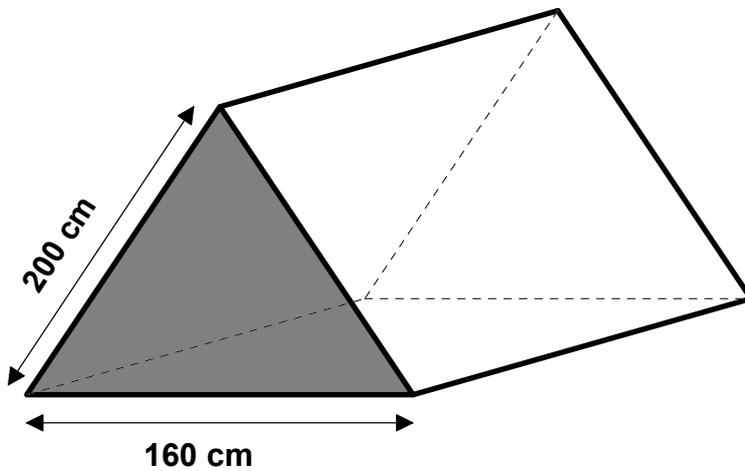
Number of posts (p)	2	3	4	5	6
Number of rails (r)	6	12			

- (b) Create a formula to calculate the number of rails (r) if you know the number of posts (p).

- (c) Use the formula to calculate how many rails there would be between 52 posts.

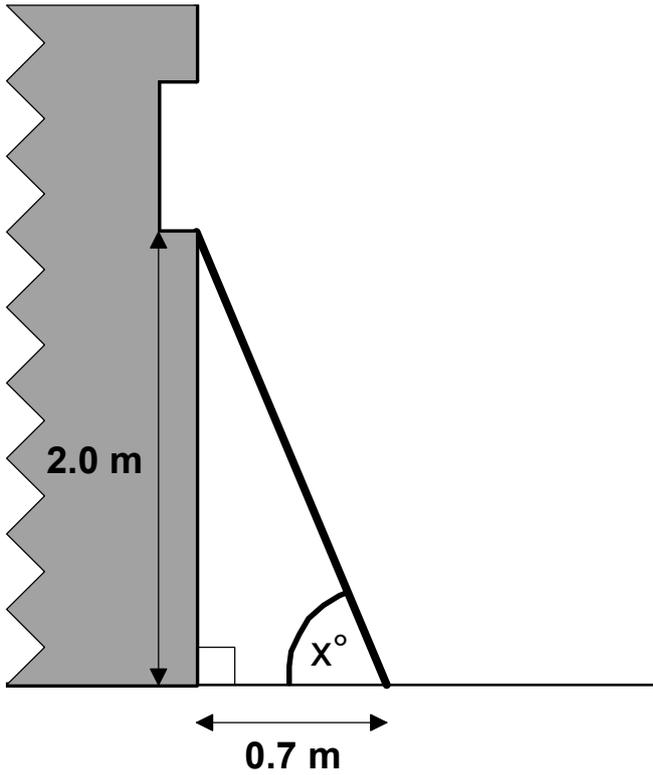
4. Anna takes the train from Glasgow to Helensburgh.
The distance of the journey is 23 miles and it took the train 50 minutes.
Calculate the average speed of the train in mph.

5. The end of a ridge tent forms an isosceles triangle and is shaded below.
The base of the triangle is 160 cm and the sloping height is 200cm.



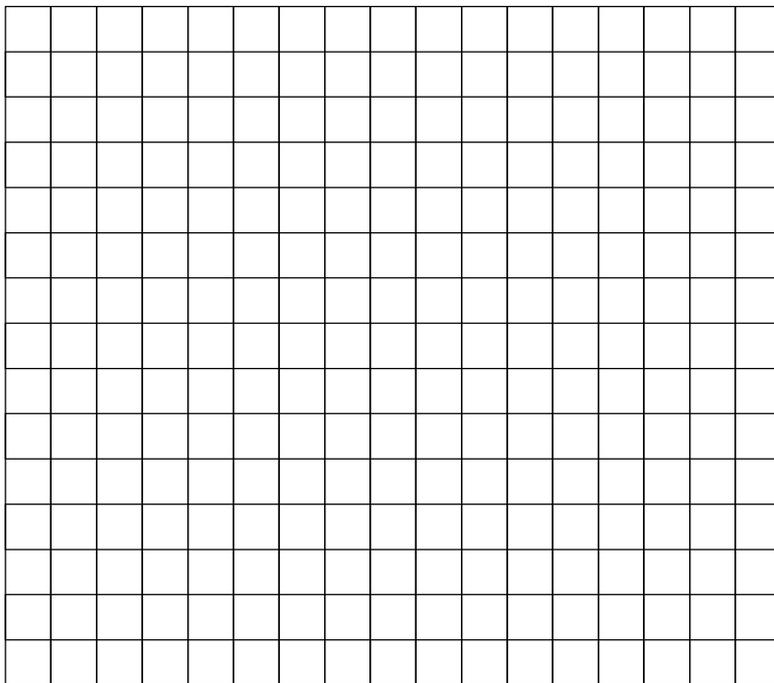
Calculate the vertical height of the tent.

6. A ladder is placed against a wall to reach a ledge as shown in the diagram below.



Find the size of the angle marked x° .

7. (a) Draw a set of coordinate axes on the grid below and plot the points A(-4,-2), B(1,-2) and C(3,2).



- (b) Plot a fourth point, D, to form a parallelogram.
(c) Write down the coordinates of the point D.

[End of Part 2 of the test]

Achievement of assessment standard

Part 1

Question	Points of process and accuracy	Expected Responses
1	<ul style="list-style-type: none"> ◆ Evidence of appropriate division and multiplication ◆ Correct division ◆ Correct multiplication 	<ul style="list-style-type: none"> ◆ divide by 10 and multiply by 4 or equivalent ◆ 15 or 1.5 ◆ 60 pupils
2	<ul style="list-style-type: none"> ◆ Evidence of attempt to find the total of goals and divide appropriately ◆ Correct addition ◆ Correct division by 6 ◆ Rounded answer 	<ul style="list-style-type: none"> ◆ $(0+5+7+4+2+5)/6$ ◆ 23 ◆ 3.8333 ◆ 3.83 goals
3	<ul style="list-style-type: none"> ◆ Evidence of division by 5 and multiplication by 3 ◆ Divide by 5 correctly ◆ Multiply by 3 correctly 	<ul style="list-style-type: none"> ◆ $85 \div 5 \times 3$ ◆ 17 ◆ 51 litres
4	<ul style="list-style-type: none"> ◆ Evidence of appropriate addition and subtraction ◆ Correct addition ◆ Correct subtraction 	<ul style="list-style-type: none"> ◆ $2.65 + 1.5 - 3.85$ ◆ 4.15 ◆ 0.3 kg
5	<ul style="list-style-type: none"> ◆ Evidence of appropriate multiplication ◆ Correct multiplication 	<ul style="list-style-type: none"> ◆ 12.95×7 ◆ £90.65

Total process and accuracy points for Part 1: 15

Part 2

Question	Points of process and accuracy	Expected Responses
1	<ul style="list-style-type: none"> ◆ Correct gathering of x terms ◆ Correct gathering of number terms ◆ Correct solution 	<ul style="list-style-type: none"> ◆ $2x$ or 10 ◆ $2x = 10$ ◆ $x = 5$
2	<ul style="list-style-type: none"> ◆ Finds the area of the rectangle ◆ Finds the radius of the semi-circle ◆ Finds the area of the semi-circle ◆ Total area <p># overall strategy</p>	<ul style="list-style-type: none"> ◆ $70 \times 40 = 2800$ ◆ 20 ◆ $\frac{1}{2} \times \pi \times 20^2 = 628$ ◆ 3428 cm^2 <p># Evidence of composite area including finding the radius of the circle</p>
3(a) (b)	<ul style="list-style-type: none"> ◆ Table completed ◆ Evidence of multiplier <p># Strategy for formula</p>	<ul style="list-style-type: none"> ◆ $18, 24, 30$ ◆ Evidence of $\times 6$ <p># Evidence of correct two operations in the correct answer and attempt to create formula</p>
(c)	<ul style="list-style-type: none"> ◆ Correct formula ◆ Correct number of rails 	<ul style="list-style-type: none"> ◆ $r = 6p - 6$ ◆ 306 rails
4	<ul style="list-style-type: none"> ◆ Correct time in hours ◆ Correct use of formula ◆ Correct calculation 	<ul style="list-style-type: none"> ◆ 0.833 or $\frac{5}{6}$ ◆ $23 \div 0.833$ ◆ 27.6 mph
5	<p># Right-angled triangle strategy</p> <ul style="list-style-type: none"> ◆ Find half the base ◆ Correct Pythagoras statement ◆ re-arranges correctly ◆ Correct vertical height 	<p># Evidence of creating right-angled triangle and applying Pythagoras' theorem to find the height</p> <ul style="list-style-type: none"> ◆ 80 ◆ $80^2 + h^2 = 200^2$ or equivalent ◆ $h^2 = 200^2 - 80^2$ ◆ 183.3 cm
6	<ul style="list-style-type: none"> ◆ Know to use tangent ratio ◆ State correct ratio ◆ Correct angle 	<ul style="list-style-type: none"> ◆ $\tan x^\circ$ ◆ $\frac{2}{0.7}$ ◆ 70.7°
7(a)	<ul style="list-style-type: none"> ◆ Plot three points A, B and C 	<ul style="list-style-type: none"> ◆ Points correctly plotted
(b)	<p># D plotted</p>	<p># D plotted correctly</p>
(c)	<ul style="list-style-type: none"> ◆ Parallelogram drawn ◆ Coordinates of D 	<ul style="list-style-type: none"> ◆ Points joined correctly ◆ $(-2, 2)$

- ◆ **Total process and accuracy points for whole test: 39**
- # **Total reasoning points for this test: 4**