

# FOCUS 7 TASKS - Set 1

Each of the 30 topics is covered once within the 5 sheets

## Sheet 1A

Inverse proportion	Q1
nth term of a quadratic sequence	Q2
Lines and midpoints	Q3
Factorising quadratics	Q4
Histograms	Q5
Probability	Q6

## Sheet 1B

Direct proportion	Q1
Rearranging formulae	Q2
Completing the square	Q3
Calculations involving exact trig values	Q4
Area and perimeter of a sector	Q5
Area of a triangle (using sine)	Q6

## Sheet 1C

Rationalising the denominator	Q1
Indices	Q2
Using the quadratic formula	Q3
Proof	Q4
Surface Area	Q5
Sine Rule	Q6

## Sheet 1D

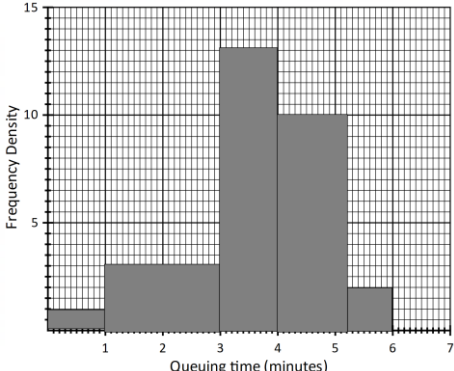
Ratios	Q1
Simultaneous equations	Q2
Composite functions	Q3
Similarity 2D and 3D	Q4
Vectors	Q5
Stratified sampling	Q6

## Sheet 1E

Upper and lower bounds	Q1
Expanding 3 brackets	Q2
Rational expressions	Q3
Translating graphs	Q4
Volume	Q5
Cosine Rule	Q6

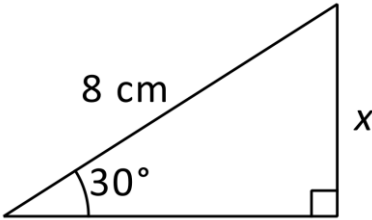
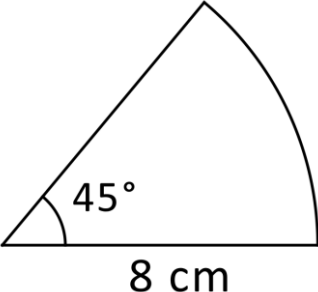
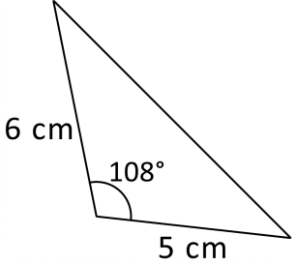
## SKILLS CHECK

Write down the equation of the circle with radius 4 and centre (0,0)	Work out $1\frac{1}{2} + \frac{4}{5}$	Solve $4x - 3 = 2x + 1$	Expand and simplify $\sqrt{3}(4 + 2\sqrt{3})$
State the gradient and the y intercept of the line $2y + x = 8$	Pressure = $0.4 \text{ N/m}^2$ Area = $0.1 \text{ m}^2$ Force = ?	Increase £452 by 2.5%	Estimate $\frac{245 + 172}{35 \times 0.052}$

<b>QUESTION 1</b> y is inversely proportional to the square root of x When $x = 64$ $y = 4$ Find the value of x when $y = 8$	<b>QUESTION 2</b> Find the nth term of 3, 11, 25, 45, 71	<b>QUESTION 3</b> Calculate the distance between the points (-2, 5) and (5, 9) correct to 1 decimal place  Work out the coordinates of the midpoint
<b>QUESTION 4</b> Factorise $6x^2 - 5x - 6$	<b>QUESTION 5</b> Estimate the number of customers who queued for between 1 and 5 minutes.  	<b>QUESTION 6</b> A bag contains 4 red and 5 blue counters. 2 counters are picked at random (without replacement). Calculate the probability that the counters are different colours.

## SKILLS CHECK

Write down the equation of the circle with radius 9 and centre (0,0)	Work out $2\frac{2}{3} \times 1\frac{1}{2}$	Solve $\frac{x+3}{4} = \frac{x+4}{3}$	Expand and simplify $2\sqrt{2}(2+3\sqrt{2})$
State the gradient and the y intercept of the line $2y - 4x = 2$	Average speed = 54 km/h Time = 50 minutes Distance = ?	Decrease £48 by 15%	Estimate $\frac{3.72 \times 9.52}{0.52^2}$

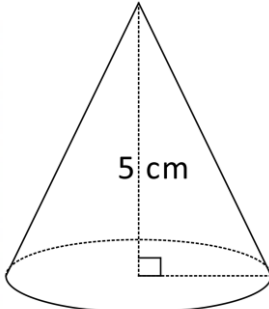
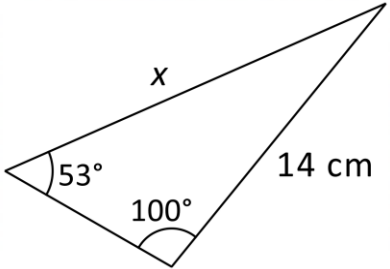
<p><b>QUESTION 1</b></p> <p>s is directly proportional to the cube t. When <math>t = 3</math>, <math>s = 108</math> Find the value of s when <math>t = 5</math></p>	<p><b>QUESTION 2</b></p> <p>Make x the subject of the formula <math>x + b = ax + c</math></p>	<p><b>QUESTION 3</b></p> <p>Express <math>x^2 - 6x + 2</math> in completed square form and write down the coordinates of the vertex of the graph <math>y = x^2 - 6x + 2</math></p>
<p><b>QUESTION 4</b></p> <p>Without using a calculator work out the value of x</p> 	<p><b>QUESTION 5</b></p> <p>Calculate the perimeter of the sector. Leave your answer in terms of <math>\pi</math></p> 	<p><b>QUESTION 6</b></p> <p>Calculate the area of the triangle (correct to 1 decimal place)</p> 

# FOCUS 7 TASK 1C

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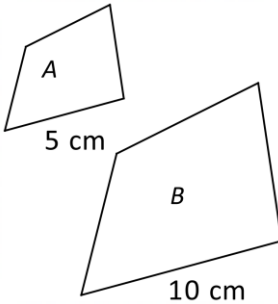
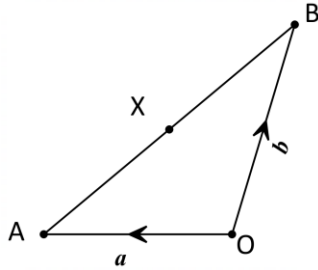
## SKILLS CHECK

Write down the equation of the circle with radius 1 and centre (0,0)	Work out $\frac{1}{2} \div 1\frac{1}{5}$	Solve $2(5 - x) = 1 - x$	Expand and simplify $3\sqrt{3}(1 - 3\sqrt{3})$
State the gradient and the y intercept of the line $2x - y = 3$	Mass = 10g Density = $25\text{g/cm}^3$ Volume = ?	Express 31 out of 40 as a percentage	Estimate $\sqrt[3]{9.54^2 + 4.51 \times 5.21}$

<b>QUESTION 1</b> Rationalise the denominator $\frac{2\sqrt{3} + 6}{\sqrt{3}}$	<b>QUESTION 2</b> Evaluate $16^{-\frac{1}{2}} \times 8^{\frac{5}{3}}$	<b>QUESTION 3</b> Solve $4x^2 - 5x - 2 = 0$ using the quadratic formula (answer correct to 2 d.p.)
<b>QUESTION 4</b> Show that $(n + 5)^2 - (n - 5)^2$ is an even number for all positive values of n.	<b>QUESTION 5</b> Calculate the surface area of the cone correct to 1 d.p.  radius = 2 cm	<b>QUESTION 6</b> Calculate x correct to 1 d.p. 

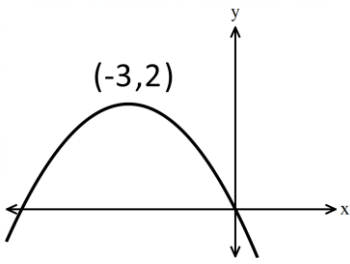
## SKILLS CHECK

Write down the equation of the circle with radius 9 and centre (0,0)	Work out $2\frac{1}{8} - 1\frac{4}{5}$	Solve $\frac{5}{x+2} = 3$	Expand and simplify $\sqrt{3} + \sqrt{27} - 2\sqrt{3}$
State the gradient and the y intercept of the line $2x + 6y = 15$	Distance = 30 km Time = 36 minutes Speed = ? km per hour	Calculate 120% of £54	Estimate $4.8^2 + 9.09 \times \sqrt{3.5}$

<p><b>QUESTION 1</b></p> <p>The ratio of red to green beads in a bag is 2 : 5. The ratio of green to blue beads in the same bag is 3 : 5. If there are 75 blue beads in the bag, how many red beads are there?</p>	<p><b>QUESTION 2</b></p> <p>Solve simultaneously  <math>y = 3x - 1</math>  <math>y = x^2 + 1</math></p>	<p><b>QUESTION 3</b></p> <p>Given that <math>f(x) = 2x - 1</math> and <math>g(x) = x^2</math> solve <math>gf(x) = 1</math></p>												
<p><b>QUESTION 4</b></p> <p>A and B are mathematically similar. If the area of A is <math>12 \text{ cm}^2</math> calculate the area of B.</p> 	<p><b>QUESTION 5</b></p> <p>X is the midpoint of AB. Write an expression for OX in terms of vectors <b>a</b> and <b>b</b></p> 	<p><b>QUESTION 6</b></p> <p>A stratified sample of 60 students is needed for a survey. How many students from Year 8 should be included in the survey?</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Number of students</th> </tr> </thead> <tbody> <tr> <td>7</td> <td>125</td> </tr> <tr> <td>8</td> <td>110</td> </tr> <tr> <td>9</td> <td>90</td> </tr> <tr> <td>10</td> <td>135</td> </tr> <tr> <td>11</td> <td>140</td> </tr> </tbody> </table>	Year	Number of students	7	125	8	110	9	90	10	135	11	140
Year	Number of students													
7	125													
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## SKILLS CHECK

Write down the equation of the circle with radius 15 and centre (0,0)	Work out $1\frac{1}{10} \div 1\frac{3}{10}$	Solve $\frac{x}{2} - 4 = x - 5$	Expand and simplify $\sqrt{2}(\sqrt{8} + 4\sqrt{2})$
State the gradient and the y intercept of the line $\frac{y}{2} + x = 1$	Force = 20 Area = 0.25 m <sup>2</sup> Pressure = ?	Express 48 out of 800 as a percentage	Estimate $\frac{124 - 9.54}{0.29^2}$

<p><b>QUESTION 1</b></p> <p>A rectangular field has a length of 140 m, to the nearest 5 metres and a width of 120 m, to the nearest metre.</p> <p>Work out the lower bound for the perimeter of the field</p>	<p><b>QUESTION 2</b></p> <p>Expand and simplify <math>(x + 3)(x - 2)(x - 1)</math></p>	<p><b>QUESTION 3</b></p> <p>Simplify <math>\frac{(x^2 - 1)(x - 3)}{(x^2 - 4x + 3)(x + 1)}</math></p>
<p><b>QUESTION 4</b></p> <p>The graph of <math>y = f(x)</math> is shown with maximum point (-3,2)</p>  <p>Write down the coordinates of the maximum point of the curve with equation <math>y = f(x - 2)</math></p>	<p><b>QUESTION 5</b></p> <p>A sphere of radius <math>r</math> has the same volume as a cylinder with the same radius. Find an expression for the height of the cylinder.</p>	<p><b>QUESTION 6</b></p> <p>Calculate the size of angle <math>x</math> (correct to 1 d.p.)</p> 