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.

<table>
<thead>
<tr>
<th>Part</th>
<th>Question</th>
<th>Operational Skills</th>
<th>Reasoning Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td></td>
<td>7</td>
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</tbody>
</table>

Total points of process and accuracy available: **39**

Total achieved: **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:

\[ \tan x^\circ = \frac{\text{opposite}}{\text{adjacent}} \]
\[ \sin x^\circ = \frac{\text{opposite}}{\text{hypotenuse}} \]
\[ \cos x^\circ = \frac{\text{adjacent}}{\text{hypotenuse}} \]

Gradient:

\[ \text{Gradient} = \frac{\text{vertical height}}{\text{horizontal distance}} \]
1. In a primary school, 40% of the pupils are boys. There are 150 pupils altogether. How many pupils are boys?

2. The number of goals scored in football matches are shown below.

0, 5, 7, 4, 2, 5

Calculate the mean number of goals scored. Round your answer to 2 decimal places.

3. A car's petrol tank holds 85 litres of fuel. The petrol gauge indicates that the tank is \( \frac{3}{5} \) full. How many litres of petrol is in the tank?
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?
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.

(a) Complete the following table.

<table>
<thead>
<tr>
<th>Number of posts (p)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of rails (r)</td>
<td>6</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(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 200 cm.

![Diagram of a triangle]

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 $x^\circ$.

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

<table>
<thead>
<tr>
<th>Question</th>
<th>Points of process and accuracy</th>
<th>Expected Responses</th>
</tr>
</thead>
</table>
| 1        | * Evidence of appropriate division and multiplication  
          * Correct division  
          * Correct multiplication | * divide by 10 and multiply by 4 or equivalent  
          * 15 or 1.5  
          * 60 pupils |
| 2        | * Evidence of attempt to find the total of goals and divide appropriately  
          * Correct addition  
          * Correct division by 6  
          * Rounded answer | * (0+5+7+4+2+5)/6  
          * 23  
          * 3.8333  
          * 3.83 goals |
| 3        | * Evidence of division by 5 and multiplication by 3  
          * Divide by 5 correctly  
          * Multiply by 3 correctly | * 85 ÷ 5 × 3  
          * 17  
          * 51 litres |
| 4        | * Evidence of appropriate addition and subtraction  
          * Correct addition  
          * Correct subtraction | * 2.65 + 1.5 - 3.85  
          * 4.15  
          * 0.3 kg |
| 5        | * Evidence of appropriate multiplication  
          * Correct multiplication | * 12.95 × 7  
          * £90.65 |

Total process and accuracy points for Part 1: 15
<table>
<thead>
<tr>
<th>Question</th>
<th>Points of process and accuracy</th>
<th>Expected Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Correct gathering of x terms • Correct gathering of number terms • Correct solution</td>
<td>• $2x$ or $10$ • $2x = 10$ • $x = 5$</td>
</tr>
<tr>
<td>2</td>
<td>• Finds the area of the rectangle • Finds the radius of the semi-circle • Finds the area of the semi-circle • Total area</td>
<td>• $70 \times 40 = 2800$ • $20$ • $\frac{1}{2} \times \pi \times 20^2 = 628$ • $3428 \text{ cm}^2$</td>
</tr>
<tr>
<td>3(a) (b)</td>
<td>• Table completed • Evidence of multiplier</td>
<td>• $18, 24, 30$ • Evidence of x6</td>
</tr>
<tr>
<td></td>
<td># Strategy for formula</td>
<td># Evidence of correct two operations in the correct answer and attempt to create formula</td>
</tr>
<tr>
<td>(c)</td>
<td>• Correct formula • Correct number of rails</td>
<td>• $r = 6p - 6$ • $306 \text{ rails}$</td>
</tr>
<tr>
<td>4</td>
<td>• Correct time in hours • Correct use of formula • Correct calculation</td>
<td>• $0.833$ or $\frac{5}{6}$ • $23 \div 0.833$ • $27.6 \text{ mph}$</td>
</tr>
<tr>
<td>5</td>
<td># Right-angled triangle strategy</td>
<td># Evidence of creating right-angled triangle and applying Pythagoras’ theorem to find the height</td>
</tr>
<tr>
<td></td>
<td>• Find half the base • Correct Pythagoras statement • re-arranges correctly • Correct vertical height</td>
<td>• $80$ • $80^2 + h^2 = 200^2$ or equivalent • $h^2 = 200^2 - 80^2$ • $183.3 \text{ cm}$</td>
</tr>
<tr>
<td>6</td>
<td>• Know to use tangent ratio • State correct ratio • Correct angle</td>
<td>• $\tan x^\circ$ • $\frac{2}{0.7}$ • $70.7^\circ$</td>
</tr>
<tr>
<td>7(a)</td>
<td>• Plot three points A, B and C</td>
<td>• Points correctly plotted</td>
</tr>
<tr>
<td>(b)</td>
<td># D plotted</td>
<td># D plotted correctly</td>
</tr>
<tr>
<td>(c)</td>
<td>• Parallelogram drawn • Coordinates of D</td>
<td>• Points joined correctly • $(-2,2)$</td>
</tr>
</tbody>
</table>

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

K.Rybarczyk 2013