1st November

Find x

Shown are class 7A’s and 7B’s test results.

Compare their results

Factorise

2x² + 5x − 7

Solve

2x² + 5x − 7 = 0

Enlarge by scale factor $-\frac{1}{3}$
2nd November

x is $\frac{3}{5}$ of y
y is $\frac{7}{8}$ of z

Write down the ratio of $x : y : z$

Expand and simplify

$(y - 3)(y + 1)(y + 4)$

Shown is a square

The length of each diagonal is 4cm.
Find the perimeter of the square.

Simplify $\sqrt{220}$

Simplify $\frac{2a^4 \times 6b^2}{3b^3 \div 5a}$
### 3rd November

<table>
<thead>
<tr>
<th>Calculate the volume of the cylinder.</th>
<th><img src="image" alt="Cylinder Diagram" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>16 cylinders are placed in a box of height 30cm as shown.</td>
<td><img src="image" alt="Cylinders Diagram" /></td>
</tr>
<tr>
<td>Calculate the percentage of the box that is not filled by the cylinders.</td>
<td></td>
</tr>
<tr>
<td>Find x</td>
<td></td>
</tr>
<tr>
<td>Factorise</td>
<td>$2x^2 - 7x - 15$</td>
</tr>
<tr>
<td>Mrs Jenkins is making decorations for a wedding. She needs $18\sqrt{5}$ metres of ribbon in total. Mrs Jenkins has 40 metres of ribbon. Does she have enough ribbon?</td>
<td><img src="image" alt="Ribbon Diagram" /></td>
</tr>
</tbody>
</table>

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Using a ruler and compasses, construct the perpendicular from the line GH to the point I.

Shown is the graph \( y = 3x^2 - 10x - 25 \)
Find the coordinates D, E and F

Complete the table.

<table>
<thead>
<tr>
<th></th>
<th>Height</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>24 inches</td>
<td>100 litres</td>
</tr>
<tr>
<td>Medium</td>
<td>30 inches</td>
<td></td>
</tr>
<tr>
<td>Large</td>
<td></td>
<td>240 litres</td>
</tr>
</tbody>
</table>

Simplify \( \frac{9x^2 - 1}{3x^2 - 13x + 4} \)
### 5th November

**Find x**

- **Solve, giving your answers to one decimal place.**
  
  \[4x^2 + 8x + 3 = 0\]

- **The side length of a square table is 105 cm, correct to the nearest centimetre.**
  
  Find the smallest possible perimeter of the table.

- **Simplify**
  
  \[
  \frac{ab}{c} \times \frac{c}{ae}
  \]

- **Calculate the volume of this cone.**

---

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6th November

<table>
<thead>
<tr>
<th>Time, (t)</th>
<th>Cumulative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 &lt; t ≤ 40</td>
<td>4</td>
</tr>
<tr>
<td>0 &lt; t ≤ 60</td>
<td>11</td>
</tr>
<tr>
<td>0 &lt; t ≤ 70</td>
<td>16</td>
</tr>
<tr>
<td>0 &lt; t ≤ 80</td>
<td>22</td>
</tr>
<tr>
<td>0 &lt; t ≤ 100</td>
<td>30</td>
</tr>
</tbody>
</table>

Draw a cumulative frequency graph for this information.

Find the equation of Line 1

Shown is Line 1 and also the point A (0, 4)

Write down the equation of the line parallel to Line 1 and that passes through the point A

Make m the subject of

\[ y - mp = np + 2y \]
Find angle DAB.

Find angle ABC.

Work out

\[ 16^{1.5} + 8^0 \]

Draw a histogram for this data.

<table>
<thead>
<tr>
<th>Length, ( l )</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>( 0 &lt; l \leq 4 )</td>
<td>36</td>
</tr>
<tr>
<td>( 4 &lt; l \leq 6 )</td>
<td>40</td>
</tr>
<tr>
<td>( 6 &lt; l \leq 8 )</td>
<td>48</td>
</tr>
<tr>
<td>( 8 &lt; l \leq 12 )</td>
<td>44</td>
</tr>
<tr>
<td>( 12 &lt; l \leq 20 )</td>
<td>32</td>
</tr>
</tbody>
</table>

The length of a line is 24 centimetres, correct to the nearest centimetre.

Write down the greatest possible length of the line.

Write down the least possible length of the line.
8th November

Shape A is translated by vector \( \begin{pmatrix} 3 \\ -1 \end{pmatrix} \) to make Shape B.

Shape B is translated by vector \( \begin{pmatrix} -5 \\ -2 \end{pmatrix} \) to make Shape C.

Describe the single transformation that maps Shape C to Shape A

Work out the value of

\( 125 \frac{2}{3} \)

Find AC.

The area of the sector is 27cm\(^2\).
Find the size of the missing angle.

Write down the equation of a line perpendicular to \( y = 5x + 3 \)
9th November

BC is 16cm.
AC is 12cm.
Find the area of the circle.

A region R satisfies the inequalities

\[ x + y \leq 7 \]
\[ x > 2 \]
\[ y \leq 3 \]
Show this region on the grid.

Sophie rolls an ordinary 6 sided dice three times.
What is the probability she gets exactly one 6?

A helicopter leaves Bristol and flies due east for 10 miles. Then the helicopter flies 8 miles north before landing.
Calculate the bearing of the helicopter from Bristol.
10th November

Solve the simultaneous equations

\[7x - 15y = 2.5\]
\[3x - 2y = 5.5\]

Simplify fully

\[
\frac{x^2 + 8x}{x^2 + 10x + 16}
\]

A greengrocer sells bananas and apples. In one day he sells up to 80 bananas up to 90 apples no more than a total of 110 pieces of fruit Let \(x\) be the number of bananas sold Let \(y\) be the number of apples sold.

Show the region below that satisfies these inequalities

Given that

\[a : b = 5 : 2\] and \[b : c = 9 : 11\]

Find the ratio \(a : c\)

Give your answer in its simplest form.
11th November

Enlarge the triangle by scale factor $-\frac{1}{2}$, using centre of enlargement $(0, 0)$

Simplify \[
\frac{x}{y} \times \frac{x}{y}
\]

Simplify \[
\frac{4x}{5y} \times \frac{3y}{8x}
\]

Lowest: 20
Lower Quartile: 50
Median: 65
Upper Quartile: 72
Highest: 108

Draw the box plot above.

Calculate the range.

Calculate the interquartile range.
12th November

The bearing of A from B is 245°

Find the bearing of B from A.

Find x

The sum of the interior angles in a polygon is 7380°.

Calculate the number of sides the polygon has.

Solve the simultaneous equations

\[4x - y = 17\]
\[y = x - 2\]

Find the area of the sector.
13th November

Evaluate

$$81^{0.5}$$

Which of these points is not 10 units from the point (0, 1)?

(10, 1) (6, 9) (1, 11)

(0, -9) (-8, 7) (-10, 1)

A restaurant menu has 6 starters, 9 mains and 7 desserts.

A customer can choose:
- a starter and a main
- a main and a dessert
- a starter, a main and a dessert

Use the information in the histogram to complete the frequency table.

<table>
<thead>
<tr>
<th>weight (w kg)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 &lt; w ≤ 10</td>
<td>34</td>
</tr>
<tr>
<td>10 &lt; w ≤ 15</td>
<td>33</td>
</tr>
<tr>
<td>15 &lt; w ≤ 20</td>
<td></td>
</tr>
<tr>
<td>20 &lt; w ≤ 40</td>
<td></td>
</tr>
<tr>
<td>40 &lt; w ≤ 55</td>
<td>6</td>
</tr>
</tbody>
</table>

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14th November

<table>
<thead>
<tr>
<th>A recipe for a drink says</th>
<th>What is the maximum amount of the drink that she can make?</th>
</tr>
</thead>
<tbody>
<tr>
<td>“mix 2 parts orange juice with 7 parts lemonade.”</td>
<td>Victoria has 100ml of orange juice and 300ml of lemonade.</td>
</tr>
</tbody>
</table>

Find \( x \)

Find the coordinates where the line \( y = 8x - 15 \) and the curve \( y = x^2 \) meet.

Write 1008 as a product of prime factors.

Express your answer in index form.

Hence find the **least** number by which 1008 would need to be multiplied by to give a square number.
**15th November**

On an airplane, the ratio of men to women is 7:5. The ratio of women to children is 4:3.

Jack says more than half the passengers are men. Is he correct?

Find $y$

Simplify fully

$$\frac{x^2 - 4x - 12}{x^2 - x - 30}$$

Simplify

$$\sqrt{3} \times \sqrt{3} \times \sqrt{2} \times \sqrt{2}$$

A shop sells two different sizes of rugby ball.

A small rugby ball has a length of 8cm and surface area of 90 cm$^2$

A large rugby ball has a length of 16cm. Calculate the surface area of a large rugby ball.
### 16th November

#### Simplify $\sqrt{60}$

#### Find the area of shape BDEF

#### Find the perimeter of shape BDEF

#### James, Fred and Kevin each take a penalty
   - The probability James scores is $\frac{3}{4}$
   - The probability Fred scores is $\frac{2}{3}$
   - The probability Kevin scores is $\frac{3}{4}$

What is the probability that all three score?

#### Solve

$$4x^2 + 4x - 3 = 0$$
<table>
<thead>
<tr>
<th>17th November</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Write down the value of $\sin x$. Give your answer as a fraction.</td>
<td></td>
</tr>
<tr>
<td>Simplify $\frac{3}{w} \times \frac{x}{4} \times \frac{y}{w}$</td>
<td></td>
</tr>
<tr>
<td>Find the area of the parallelogram.</td>
<td></td>
</tr>
<tr>
<td>Circle the values which are irrational</td>
<td>$\frac{\sqrt{64}}{4} \sqrt{3}$ 100$^{0.5}$ $\pi$</td>
</tr>
<tr>
<td>Solve $5^x = 40$. Give your answer to 1 decimal place.</td>
<td></td>
</tr>
</tbody>
</table>
### 18th November

**Shape A is translated by vector** $\begin{pmatrix} -4 \\ 9 \end{pmatrix}$ **to make Shape B.**

**Shape B is translated by vector** $\begin{pmatrix} 8 \\ 0 \end{pmatrix}$ **to make Shape C.**

Describe the single transformation that maps Shape A to Shape C.

Find $x$ and $y$

Find fully

\[
\frac{4x^2 - 25}{6x^2 - 11x - 10}
\]

Write 1.2525252525... as a fraction.

Martin invests £500 into a savings account that pays X% interest per annum. After 5 years, he has £750 in the account.

Find X.
19th November

Work out $9^0$  

Work out $9^{\frac{1}{2}}$

A coin is flipped three times.
What is the probability of getting three tails?

Simplify $\frac{ab}{3} \div \frac{2a}{b}$

Complete the table of value for $y = \frac{4}{x}$

<table>
<thead>
<tr>
<th>$x$</th>
<th>0.5</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>8</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On the grid, draw the graph of $y = \frac{4}{x}$
for $0.25 \leq x \leq 10$
## 20th November

Match each graph to the correct equation

<table>
<thead>
<tr>
<th>Graph A</th>
<th>Graph B</th>
</tr>
</thead>
</table>

| Graph C | Graph D |

- \( y = x^2 \) is graph A
- \( y = x^3 \) is graph ..........
- \( y = 2^x \) is graph ..........
- \( y = \frac{1}{x} \) is graph ..........

**Estimate** \( 38 \frac{3}{2} \)

Simplify fully

\[
\frac{x^2 + 8x}{x^2 + 10x + 16}
\]

Solve, giving your answers to one decimal place.

\( x^2 + 2x - 4 = 0 \)
21st November

The population of a country is $4.8 \times 10^6$.

The population of a city is $8 \times 10^5$.

What percentage of the population of the country live in that city?

Find $x$.

Estimate the median.

Using the cumulative frequency curve, how many people took over 95 seconds?

Write down the Sine Rule.

Write down the Cosine Rule.
### 22nd November

y is directly proportional to the square of x.
When y = 32, x = 4.

Find the value of y when x = 8.

| ABCDEF and GHIJKL are regular hexagons with centre O. GHIJKL is an enlargement of ABCDEF, with scale factor 2. |
| Factorise \(9y^2 - 144\) |
| Calculate the surface area of the cylinder. |

| Write down a vector for \(\vec{AB}\) |
| Write down a vector for \(\vec{FC}\) |

| Factorise \(9y^2 - 144\) |

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23rd November

\(\xi = 80\) students  
\(C = \) students that have visited Canada  
\(S = \) students that have visited Sweden

50 students have visited only Canada or only Sweden

\(\frac{3}{10}\) of these 50 students have only visited Sweden

The number of students who have visited Canada is double the number of students that have visited Sweden

Complete the Venn Diagram

The probability of a team winning a match is 0.8.

The team plays three matches.

What is the probability the team wins all three matches?

Write down the equation of the line shown.

A line is perpendicular to the line shown and passes through \((0, 10)\).

Find its equation.
### 24th November

A group of workers are painting the classrooms in a school. 10 workers could paint all the classrooms in 12 days. For the first five days, only two workers paint the classrooms. For the next six days, only five workers paint the classrooms. For the rest of the days, all 10 workers paint the classrooms.

Work out the total number of days taken to paint the classrooms.

---

Find the value of

\[
64^{\frac{2}{3}}
\]

---

Find angle ABC.

---

Find angle OAB.

**O** is the centre of the circle. Angle AOC is 140°.

---

Find y.
25th November

AB is a tangent
Find x

Evaluate
\[
\left( \frac{16}{25} \right)^{\frac{1}{2}}
\]

Simplify
\[
\frac{x^2 + 11x}{x^2 - 121}
\]

Lenny is drawing a histogram.
Calculate each frequency density.

D is inversely proportional to P.
Sketch this graph.
26th November

<table>
<thead>
<tr>
<th>Evaluate</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{3}{2}$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write down the formula to work out frequency density</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write down the equation of the line that is perpendicular to $x + 2y = 4$ and passes through the point $(0, 5)$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factorise</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3y^2 + 16y + 16$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duncan bought a toy that grows when placed in water. Before placing the toy in water it was 4cm tall. After placing the toy in water it grew to a similarly shaped toy that was 10cm tall. Is the claim reasonable?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grows 10 times larger</td>
</tr>
</tbody>
</table>

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27th November

58.9 \times 10^3 \quad fifty thousand

6000 \quad 5.98 \times 10^4

Which of these has the greatest value?

A swimming pool is 12m in width and 25m in length.
The width is to the nearest metre.
The length is to the nearest metre.
Find the minimum area.

Shape A is translated by vector \( \begin{pmatrix} -3 \\ 1 \end{pmatrix} \) to make Shape B.

Shape B is translated by vector \( \begin{pmatrix} -5 \\ -2 \end{pmatrix} \) to make Shape C.

Describe the single transformation that maps Shape C to Shape A.

Complete this frequency table.

<table>
<thead>
<tr>
<th>Length, l metres</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 &lt; l \leq 20</td>
<td>30</td>
</tr>
<tr>
<td>20 &lt; l \leq 40</td>
<td></td>
</tr>
<tr>
<td>40 &lt; l \leq 50</td>
<td>25</td>
</tr>
<tr>
<td>50 &lt; l \leq 60</td>
<td></td>
</tr>
<tr>
<td>60 &lt; l \leq 100</td>
<td>24</td>
</tr>
</tbody>
</table>

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A rectangular field has:

length 120m, to the nearest 10m.
width 86m, to the nearest metre.

Calculate the upper bound for the perimeter of the field.

Roger has a biased 6 sided dice.
The probability of a 6 is 0.8 and the other five numbers have an equal probability.

Roger rolls the dice three times.

A ball is dropped from h metres. After each bounce the ball reaches 80% of its previous height. After its third bounce it reaches a height of 3.072m.

Find h

Given that

\[ a : b = 9 : 4 \quad \text{and} \quad b : c = 7 : 3 \]

Find the ratio \( a : c \)

Give your answer in its simplest form.
AB is a tangent
Find x

Which expression(s) will always give an odd number?

Which expression(s) could give an even or odd number?

C is directly proportional to $W^3$
When $C = 9000$, $W = 10$.
Find $C$ when $W = 5$.

Simplify

$$\frac{4^5 \times 4^6}{4^3}$$

Simplify

$$\frac{2x^2 + 3x - 2}{2x^2 - 15x + 7}$$
30th November

A box contains apples and oranges in the ratio 2:5. 8 apples and 5 oranges are added to the box and the ratio of apples to oranges is now 4:7.

How many pieces of fruit were in the box to begin with?

Solve

\[
\frac{10 + 8x}{3x} = -4
\]

Write down the numbers that are in set \(A \cap B\):

\[
\begin{array}{cccc}
6 & 12 & 7 \\
3 & 36 & 11 & 1
\end{array}
\]

Michael bought a hat and a coat. The hat cost £10. He sold both items for a total of £90.

Michael made 200\% profit on the hat and 80\% profit on the total cost.

Work out his percentage profit on the cost of the coat.

Can the square fit inside the circle without touching the circle?