1st May

The fair spinner above is spun three times.
The probability of getting three greens is \(\frac{1}{27}\)

Work out the angle of the green sector

The spinner is spun another three times.
Work out the probability of obtaining one green and two blues.

Find the size of angle ABC

Evaluate
\[25 - \frac{3}{2}\]

Prove that the angle in a semi-circle is always 90°
2nd May

The total surface area of the cone is \(48\pi\) cm\(^2\). Calculate \(y\).

The graph of \(y = f(x + a) + b\) has a minimum point at the origin, where \(a\) and \(b\) are constants. Write down the values of \(a\) and \(b\).

Shown is a right angled triangle. Find \(x\)

Calculate the bearing of A from B.

---

Ship A is 100km from X on a bearing of 258°. Ship B is 75km from X on a bearing of 312°.
3rd May

**Solve** $5x^2 = 24 - 14x$

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Find the nth term of**

5  8  13  20  29 …

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Make b the subject of**

$\sqrt{\frac{4ab}{a - b}} = 5$

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Bag 1 contains 3 red, 5 white and 2 green beads
Bag 2 contains 2 red, 2 white beads and 3 green beads
Bag 3 contains 4 red, 1 white and 1 green beads.

A bead is taken from each bag at random.

A red is worth 1 point
A white is worth 2 points
A green is worth 3 points.

The points are added together.
Find the probability of scoring a 5.
<table>
<thead>
<tr>
<th>4th May</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The curve with equation</strong></td>
</tr>
<tr>
<td>$y = x^2 - 2x - 24$ is reflected in the x-axis</td>
</tr>
<tr>
<td><strong>Write the equation of the reflected curve</strong></td>
</tr>
<tr>
<td><strong>Given</strong></td>
</tr>
<tr>
<td>$f(x) = 5x - 3$</td>
</tr>
<tr>
<td>$g(x) = 2x + 1$</td>
</tr>
<tr>
<td><strong>Find</strong></td>
</tr>
<tr>
<td>$fg(-1)$</td>
</tr>
<tr>
<td><strong>OM:MA = 1:3 and N is the midpoint of AB</strong></td>
</tr>
<tr>
<td><strong>Find</strong></td>
</tr>
<tr>
<td>$\overrightarrow{OA} = 4a$</td>
</tr>
<tr>
<td>$\overrightarrow{OB} = 5b$</td>
</tr>
</tbody>
</table>

**Sketch y = f(-x)**

**Sketch y = -f(x)**

**Shown is y = f(x)**
5th May

Here are the first 5 terms of a quadratic sequence

| 3 | 9 | 17 | 27 | 39 |

Find an expression, in terms of \( n \), for the \( n \)th term of this quadratic sequence.

Explain why

\[ \cos 45 = \frac{\sqrt{2}}{2} \]

Here is a velocity/time graph for the first 12 seconds for a particle

Calculate an estimate for the acceleration of the particle at 6 seconds.

Calculate an estimate for the distance travelled by the particle in the first 8 seconds.
<table>
<thead>
<tr>
<th><strong>6th May</strong></th>
<th><strong>5-a-day</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prove that the angle at the centre is twice the angle at the circumference.</strong></td>
<td><strong>Corbettmaths</strong></td>
</tr>
</tbody>
</table>

Shown is kite ABCD

<table>
<thead>
<tr>
<th>Prove</th>
<th>( \cos BAD = 1 - \frac{x^2}{50} )</th>
</tr>
</thead>
</table>

Show, by using simultaneous equations, that the line \( y = 5x - 3 \) is a tangent to the curve \( y = x^2 + x + 1 \)

There are 9 counters in a bag.  
5 of the counters are red  
4 of the counters are white.  

Tom takes at random three counters from the bag.  

| Work out the probability that the counters are not all the same colour. | **www.corbettmaths.com** |
### 7th May

The final velocity of a traveling object is given by the formula, \( v = u + at \)

where \( v \) is the final velocity  
\( u \) is the initial velocity  
\( a \) is the acceleration  
and \( t \) is the time.

Given \( u = 5.4 \text{m/s} \) correct to 1 decimal place  
\( a = 4.9 \text{m/s}^2 \) correct to 1 decimal place  
\( v = 25.32 \text{ correct to 2 decimal places} \)

<table>
<thead>
<tr>
<th>Calculate the upper bound for ( t ).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculate the lower bound for ( t ).</td>
</tr>
</tbody>
</table>

Given that  
\[ \overrightarrow{YD} = 6a - \frac{1}{2}c \]

Find the value of \( k \)

---

OABC is a parallelogram  
\[ \overrightarrow{OA} = a \quad \overrightarrow{OC} = c \]

\( Y \) is the midpoint of \( AC \)  
OAD is a straight line where  
\( OA:AD = m : 1 \)

Prove that \( 3n(3n + 4) + (n - 6)^2 \) is positive for all values of \( n \)
### 8th May

The events $A$ and $B$ are mutually exclusive.

$P(A) = 0.5$

$P(B) = 0.4$

Find $P(A \cap B)$

Write in the form $a\sqrt{b}$, where $a$ and $b$ are integers to be found.

$$\frac{30}{\sqrt{6}}$$

Prove algebraically that the sum of the squares of any two odd numbers is always even.

Work out the rate at which the pulse is decreasing at six minutes. Include units.

Work out the rate at which the pulse is increasing at three minutes. Include units.
9th May

Solve \( x^2 + 2x - 15 < 0 \)

\[
f(x) = 7x - 2
\]

Find \( f^{-1}x \)

A bag contains 4 red sweets and 5 green sweets. Kelly removes 3 sweets, one at a time, without replacement.

Find the probability that she chooses 3 sweets of the same colour.

Calculate an estimate of the median

<table>
<thead>
<tr>
<th>Time taken ( t )</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>( 0 &lt; t \leq 10 )</td>
<td>135</td>
</tr>
<tr>
<td>( 10 &lt; t \leq 20 )</td>
<td>244</td>
</tr>
<tr>
<td>( 20 &lt; t \leq 30 )</td>
<td>555</td>
</tr>
<tr>
<td>( 30 &lt; t \leq 50 )</td>
<td>106</td>
</tr>
<tr>
<td>( 50 &lt; t \leq 100 )</td>
<td>20</td>
</tr>
</tbody>
</table>

Find the shortest possible distance between the line \( y = 4x + 5 \) and the origin.
Show \( x^2 - 7x + 1 = 0 \) can be rearranged to the form
\[
x = 7 - \frac{1}{x}
\]

Use the iteration
\[
x_{n+1} = 7 - \frac{1}{x_n}
\]
to find an approximation solution to \( x^2 - 7x + 1 = 0 \)

Start with \( x_1 = 1 \)

Find the coordinates of the point B

Find the coordinates of the point C

Shown is a circle, centre O. A and B are points on the circle. AC and BC are tangents.

The square of \( w \) is 8

Write down the value of \( w^3 \)
11th May

Find the two possible values of θ

Express as a single fraction

\[
4 - \frac{x + 5}{x - 5} - \frac{x + 1}{x + 5}
\]

In year 7 there are 50% more girls than boys.

\[\frac{3}{20}\] of the girls are left handed

\[\frac{1}{5}\] of the boys are left handed

28 of the students in year 7 are left handed.

Find how many students are in year 7

Calculate the surface area

The line \( y = x + 4 \) and the curve \( y = x^2 + 3x + 4 \) intersect at the points A and B. Find the distance between the points A and B.
12th May

Write as a power of 3

\[ \sqrt[3]{9} \]

\[ f(x) = x - 180 \]
\[ g(x) = \cos x \]

Draw \( y = gf(x) \)

Simplify fully

\[ \frac{3\cos(45^\circ) - \sin(45^\circ)}{\tan(30^\circ)} \]

Find the shaded area.

Shown above are three congruent circles. Each circle touches the other two circles and the sides of the rectangle. The radius of each circle is 30cm.
### 13th May

<table>
<thead>
<tr>
<th>James has solved the equation $x^2 + ax + b = 0$</th>
<th>Find $a$ and $b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>His solutions are $x = -3 + \sqrt{17}$ and $x = -3 - \sqrt{17}$</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solve</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{81^x}{9^{x+1}} = 3\sqrt{3}$</td>
</tr>
</tbody>
</table>

| Jim picks a five digit odd number. The second digit is less than 5. The fourth digit is a cube number The first digit is a prime number. |
| How many different numbers could he pick? |

| The line OA has a gradient of 3 The length of OA is $12\sqrt{10}$ |
| Work out the coordinates of A |
### 14th May

<table>
<thead>
<tr>
<th>Sketch the graph of $y = \sin x$ for $0 \leq x \leq 360$.</th>
</tr>
</thead>
</table>
| $\begin{align*} 
  \text{Graph of } y = \sin x, \\
  \text{for } 0 \leq x \leq 360. 
\end{align*}$ |

| $\begin{align*} 
  \text{PQR is an arc of a circle centre } O \text{ with radius 6cm.} \\
  \text{PR is a chord of the circle.} \\
  \text{Calculate the area of the shaded region.} 
\end{align*}$ |
|---|
| $\begin{align*} 
  \text{PQR is an arc of a circle centre } O \text{ with radius 6cm.} \\
  \text{PR is a chord of the circle.} \\
  \text{Calculate the area of the shaded region.} 
\end{align*}$ |

<table>
<thead>
<tr>
<th>Find the set of values of $x$ for which $x^2 - 36 &gt; 0 \text{ and } x^2 + 8x - 105 &gt; 0$</th>
</tr>
</thead>
</table>
| $\begin{align*} 
  \text{Find the set of values of } x \text{ for which } x^2 - 36 > 0 \text{ and } x^2 + 8x - 105 > 0. 
\end{align*}$ |

<table>
<thead>
<tr>
<th>Rationalise the denominator of $\frac{3 + \sqrt{2}}{\sqrt{3}}$</th>
</tr>
</thead>
</table>
| $\begin{align*} 
  \text{Rationalise the denominator of } \frac{3 + \sqrt{2}}{\sqrt{3}}. 
\end{align*}$ |

<table>
<thead>
<tr>
<th>Solve the simultaneous equations $y = x^2 + x + 2$ and $x + 3y = 38$</th>
</tr>
</thead>
</table>
| $\begin{align*} 
  \text{Solve the simultaneous equations } y = x^2 + x + 2 \text{ and } x + 3y = 38. 
\end{align*}$ |
15th May

The diagram shows the circle $x^2 + y^2 = 17$

P lies on the circle and has $x$-coordinate 1.

The tangent at P intersects the x-axis at R.

Work out the coordinates of R

Find the volume of liquid in the container

Prove that the angle in a semi-circle is always $90^\circ$

All values are correct to 2 significant figures.

Calculate the upper bound of AC.
### 16th May

<table>
<thead>
<tr>
<th>After how many seconds was the acceleration zero?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work out an estimate of the distance travelled in the first 8 seconds?</td>
</tr>
</tbody>
</table>

Here is a velocity-time graph of a particle for 24 seconds.

<table>
<thead>
<tr>
<th>Is your answer to the distance travelled an over-estimate or an under-estimate? Explain your answer</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Sketch $y = f(x + 1)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solve $2x^2 + 3x - 2 \leq 0$</td>
</tr>
</tbody>
</table>

© Corbettmaths 2017

www.corbettmaths.com
17th May

**Sketch**

\[ y = 2^x \]

<table>
<thead>
<tr>
<th>How many points of intersection does the curve ( y = (x - 3)(x + 4) ) have with the line ( y = x - 8 )?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work out an estimate of how many employees have a salary of between £2300 and £2900</td>
</tr>
</tbody>
</table>

The histogram below shows the monthly salaries of employees. There are 216 people who have a monthly salary of between £1800 and £2100.

Jim picks a five digit even number. The second digit is less than 4. The fourth digit is a square number. The first digit is a prime number.

How many different numbers could he pick?

© Corbettmaths 2017  
www.corbettmaths.com
18th May

The curve \( y = x^2 + 4x - 12 \) is reflected in the y-axis.

Write down the equation of the reflected curve.

Prove \((2n + 2)^2 - (2n + 1)\) is always odd.

Find the equation of the line that is perpendicular to \(4x + y = 8\) and passes through the point \((1, 5)\).

Find the size of the angle \(\theta\).

The diagram shows a triangle OAB and the arc AB of a circle whose centre is O and whose radius is 20cm.

Find the area of the shaded segment to the nearest cm\(^2\).
### 19th May

The curve \( y = x^2 + 3x - 10 \) is reflected in the y-axis.

Write down the equation of the reflected curve.

The town Milton is 15 miles due East from the town Newtown.

A helicopter is on a bearing of 150° from Newtown and a bearing of 240° from Milton.

A helipad is 3 miles due South of Newtown.

Work out the shortest distance from the helicopter to the helipad.

---

**Image:**

- **Sketch:** \( y = f(x - 1) \)
- **Diagram:** Angle in a semi-circle is always 90°
### 20th May

#### sin \( (x^\circ) = -0.5 \)

Write down 3 different possible values of \( x \)

<table>
<thead>
<tr>
<th>( \overrightarrow{AB} = 2a )</th>
<th>( \overrightarrow{AO} = 6b )</th>
<th>( \overrightarrow{AP}:\overrightarrow{PO} = 2:1 )</th>
</tr>
</thead>
</table>

AOB is a triangle.
P is a point on AO.

Q is the midpoint of OB.
B is the midpoint of AC.
Show PQC is a straight line.

#### Solve the simultaneous equations

\[
\begin{align*}
x^2 + y^2 &= 1 \\
x + 2y &= 1
\end{align*}
\]

ABCD is a rhombus
The coordinates of B are (2, 15)
The equation of diagonal AD is \( y = \frac{1}{2}x + 4 \)
Find the equation of diagonal BC

© Corbettmaths 2017
Find the equation of the line perpendicular to AB that passes through the midpoint of AB.

Samantha has 10 black socks, 8 white socks and 2 blue socks. She picks two socks at random, without replacement.

Calculate the probability she chooses two socks of the same colour.

Prove algebraically that 
\[(4n + 1)^2 - (2n - 1)\]
is an even number for all positive integer values of \(n\).

The \(n^{th}\) term of a quadratic sequence is \(n^2 + 4n\)

Two consecutive terms have a difference of 25.

Work out the two terms.

\[
\frac{81^y}{3^{y-5}} = 3\sqrt{3}
\]

Find \(y\)
22nd May

\[ f(y) = -2 \]

Find the possible values of \( y \)

\[
\text{Find } ff(0)
\]

| \( A \) and \( B \) are points on the circumference of a circle, centre \( O \). \n\( \text{CA is a tangent to the circle.} \n\text{Angle } \angle \text{CAB} = 2x \)
\text{Prove that angle } \angle \text{AOB} = 4x 
\text{Give reasons for each stage of your working.} |
|---|

A circle has an equation of \( x^2 + y^2 = 5 \)

\[
Q \left( \frac{4}{3}, \frac{\sqrt{29}}{3} \right) \text{ is a point on the circle.}
\]

Find the equation of the tangent to the circle at the point \( Q \).
23rd May

Simplify
\[ (27x^6)^{\frac{2}{3}} \]

AOC is an equilateral triangle of side length 14cm.
OBD is a sector of a circle with centre O and radius 11cm.

Calculate the area of the shaded region as a percentage of the area of triangle AOC.
Give your answer correct to 3 significant figures.

Find the coordinates where the line \( x + y = 3 \) and the curve \( x^2 + 3y = 27 \) intersect

Given
\[ f(x) = \sqrt{3x - 4} \]

Find \( x \) when
\[ f(x) = 2.5 \]
### 24th May

**Solve the simultaneous equations**

\[
\frac{1}{4}y = x \\
y = x^2 + 3
\]

**The Venn diagram shows information about cars in a car park.**

\[\xi = \text{cars in the car park} \]

\[R = \text{red cards} \]

\[N = \text{cars under 4 years old} \]

A car is chosen at random. Given it is under 4 years old, find the probability that it is Red.

**Find the first 3 terms of the sequence**

\[n^2 - 4n + 25 \]

**Prove every term in the sequence**

\[n^2 - 4n + 25 \text{ is positive.} \]

**The sketch shows a curve with equation**

\[y = ab^x \text{ where } a \text{ and } b \text{ are constants and } b > 0 \]

The curve passes through the points \((2, 90)\) and \((4, 810)\)

Calculate the value of \(a\) and \(b\)
25th May

Work out

\[ 4^{-\frac{5}{2}} \]

Show using algebra

\[ 1.024 = 1 - \frac{4}{165} \]

Rationalise the denominator

\[ \frac{2 - \sqrt{3}}{\sqrt{2} - 1} \]

Which has the greatest area, triangle OAB or sector ODC?
<table>
<thead>
<tr>
<th>26th May</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Write</strong> $x^2 + 4x + 9$ in the form $(x + a)^2 + b$</td>
<td><strong>Find the coordinates of the turning point of</strong> $y = x^2 + 4x + 9$</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Calculate the length</strong> $CD$.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prove that the angle at the centre is twice the angle at the circumference.</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Work out the rate at which the pulse is increasing at three minutes. Include units.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Work out the rate at which the pulse is decreasing at eight minutes. Include units.</strong></td>
</tr>
<tr>
<td>27th May</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>Find $x$</td>
<td></td>
</tr>
<tr>
<td>[ x ]</td>
<td></td>
</tr>
<tr>
<td>$\sqrt{300} \text{ cm}$</td>
<td></td>
</tr>
<tr>
<td>$\sqrt{200} \text{ cm}$</td>
<td></td>
</tr>
</tbody>
</table>

| **Expand** |
| \[(3 + \sqrt{2})(2 - \sqrt{2})\] |

| **Solve** |
| \(2x^2 - x - 6 > 0\) |

| **Circle A** |
| Equation: \(x^2 + y^2 = 9\) |

| **Translation** |
| By the vector \(\begin{pmatrix} 0 \\ 2 \end{pmatrix}\) |

| **Circle B** |
| To give Circle B |
| Sketch Circle B |

<p>| <strong>Label</strong> |
| The centre of B and the points of intersection with the x-axis |</p>
<table>
<thead>
<tr>
<th>28th May</th>
</tr>
</thead>
<tbody>
<tr>
<td>A car travelled for 170 minutes, to the nearest 5 minutes. It travelled for a total distance of 120 km, to the nearest 10 km. Work out the greatest possible average speed, in m/s</td>
</tr>
<tr>
<td>$x_{n+1} = -3 - \frac{5}{x_n^2}$ Starting with $x_0 = -4$ Find $x_1$, $x_2$ and $x_3$ Explain the relationship between the values of $x_1$, $x_2$ and $x_3$ and the equation $x^3 + 3x^2 + 5 = 0$</td>
</tr>
</tbody>
</table>

| |
| Work out the length of arc BDC |
| B, C and D are points on a circle of radius 8cm. AB and AC are tangents to the circle. AO = 11cm |
| Work out the area of sector BOC |

© Corbettmaths 2017  www.corbettmaths.com
The curve \( y = a^x \) crosses the y-axis at the point A

Write down the coordinates of A

The area of the triangle is \( 15\sqrt{3} \text{ cm}^2 \)
Find \( x \) to 3 significant figures

Find an estimate of the median

\[
\begin{array}{|c|c|}
\hline
\text{Amount spent, } m, (\text{£}) & \text{Frequency} \\
\hline
0 < m \leq 5 & 4 \\
5 < m \leq 10 & 12 \\
10 < m \leq 15 & 26 \\
15 < m \leq 20 & 8 \\
\hline
\end{array}
\]

Given
\[
f(x) = \frac{8x - 1}{5}
\]
find
\[
f^{-1}(x)
\]

The areas of the circle and triangle are equal.
Express \( y \) in terms of \( x \).
30th May

A = \{2, 3, 4, 5, 7\}

B = \{2, 3, 5, 9\}

Find \(P(A \cap B')\)

Angle SRT is 53°, to the nearest degree.
ST is 17cm to the nearest centimetre.

Work out the upper bound for the length of RS.

\[y = f(x)\] has a minimum point at (-7, -4).

The graph of \(y = f(x) + a\) has a minimum point at (-7, 0), where a is a constant.

Write down the value of a.

Make \(y\) the subject of

\[
\frac{8}{x} = \frac{3}{y} + \frac{2}{5}
\]

Sketch \(x^2 + y^2 = 9\)
### 31st May

**A = \{2, 3, 4, 5, 7\}**

**B = \{2, 3, 5, 9\}**

Find the probability of A given B

- Sketch the graph of \( y = \sin x \) for \( 0 \leq x \leq 360 \).

- By drawing an appropriate straight line, use your graph to find estimates for the solutions of \( x^2 - 2x - 1 = 0 \).

- Calculate an estimate for the gradient of the graph \( y = x^2 - x - 2 \) at the point where \( x = 1 \).

### Rebecca's Cards

Rebecca has 9 cards, each with a number on it. She picks three cards at random, without replacement. Rebecca adds the three numbers to get a score.

- Calculate the probability that the score is an odd number.

---

© Corbettmaths 2017  
[www.corbettmaths.com](http://www.corbettmaths.com)