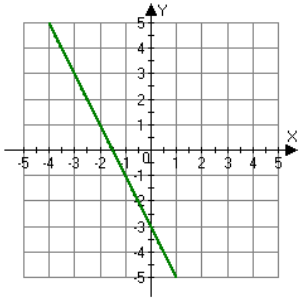
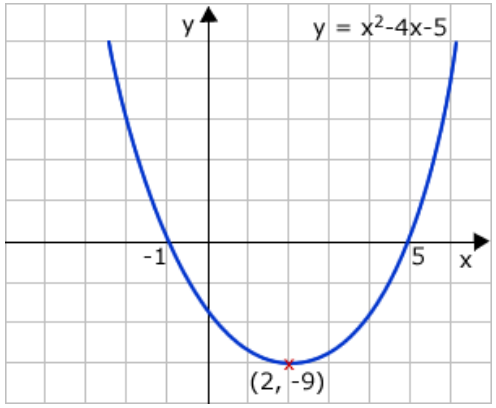
Topic/Skill	Definition/Tips	Example	Your Turn
Expanding double brackets	Multiply every term in the first bracket by every term in the second bracket **Be careful with negatives**	GRID e.g. $(x+2)(x+7)$ $x^2 + 2x + 7x + 14$ $= x^2 + 9x + 14$ SMILEY FACE e.g. $(x+3)(x+5)$ $x^2 + 3x + 5x + 15$ $= x^2 + 8x + 15$	**Expand** $(x + 2)(x + 3)$ **Expand** $(x - 2)(x + 1)$
Square a single bracket	Multiply the bracket by itself	$(x + 2)^2 = (x + 2)(x + 2)$ $= x^2 + 4x + 4$	$(x + 3)^2$**=**
Linear Graph	**Straight line** graph. The **equation** of a linear graph can contain an **x-term**, a **y-term** and a **number**. Often these come in the form $y = mx + c$	Example:  $2y - 4x = 12$ Other examples: $x = y$ $y = 4$ $x = -2$ $y = 2x - 7$	For each equation, say whether the line would be horizontal, vertical or diagonal: $x = y$ $y = 4$ $x = -2$ $y = 2x - 7$ $2y - 4x = 12$
Quadratic	A quadratic expression is of the form	Examples of quadratic expressions: x^2	Which of these are quadratic **equations?**

<table>
<tr>
<td></td>
<td>$ax^2 + bx + c$

where a, b and c are numbers, $a \neq 0$</td>
<td>$8x^2 - 3x + 7$
Examples of non-quadratic expressions:
$2x^3 - 5x^2$
$9x - 1$</td>
<td>$2x^2 = x + 20$
$x - 4 = 20$
$4 = 20 - 2x^2$
$x^3 = 20 + x^2$</td>
</tr>
<tr>
<td>Quadratic Graph</td>
<td>A ‘U-shaped’ curve called a parabola.
The equation is of the form $y = ax^2 + bx + c$, where a, b and c are numbers, $a \neq 0$.
If $a < 0$, the parabola is upside down.</td>
<td> 
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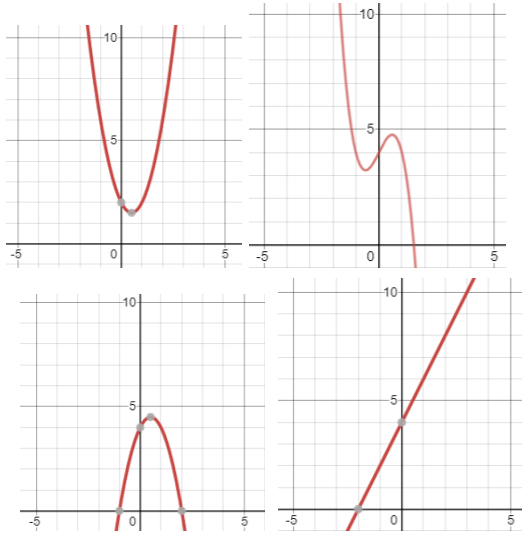
<td>Tick the Quadratic Graphs
  </td>
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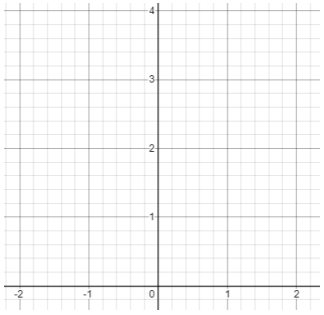
<tr>
<td>Plotting Quadratic Graphs</td>
<td>Sketching a quadratic graph is the same as with a linear equation. Choose some values for x, work out the y values, and plot the graph.</td>
<td>Find the values of y when
$y = x^2$
<table><tr><td>x</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td></tr><tr><td>y</td><td>4</td><td></td><td></td><td></td><td></td></tr></table></td>
<td>Finish the table and sketch the curve:
  </td>
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Factorising Quadratics	When a quadratic expression is in the form $x^2 + bx + c$ find the two numbers that **add to give b** and **multiply to give c**. Be careful with negatives	$x^2 + 7x + 10 = (x + 5)(x + 2)$ (because 5 and 2 add to give 7 and multiply to give 10) $x^2 + 2x - 8 = (x + 4)(x - 2)$ (because **+4** and **-2** **add to give +2** and **multiply to give -8**)	$x^2 + 3x + 4 =$ $x^2 - 3x - 2 =$
Solving Quadratics $(ax^2 = b)$	Isolate the x^2 term and square root both sides. Remember there will be a **positive and a negative solution**.	$2x^2 = 98$ $x^2 = 49$ $x = \pm 7$	$3x^2 = 75$
Solving Quadratics $(ax^2 + bx =$	**Factorise** and then **solve = 0**.	$x^2 - 3x = 0$ $x(x - 3) = 0$ $x = 0 \; or \; x = 3$	$x^2 - 5x = 0$ $4x^2 - 6x = 0$
Solving Quadratics	**Factorise** the quadratic in the usual way. **Solve = 0**	Solve $x^2 + 3x - 10 = 0$ Factorise: $(x + 5)(x - 2) = 0$	$x^2 + 5x + 6 = 0$

by Factorising ($a = 1$)	Make sure the equation = 0 before factorising.	$x = -5 \; or \; x = 2$	$x^2 = 5x - 6$