

Stating the Equation of a Parabola

Today we are revising...

How to state the equation of a parabola just by looking at it.

I will know if I have been successful if...

I can state the equation given just the roots.

I can state the equation given the turning points.

I feel confident about Tuesday!

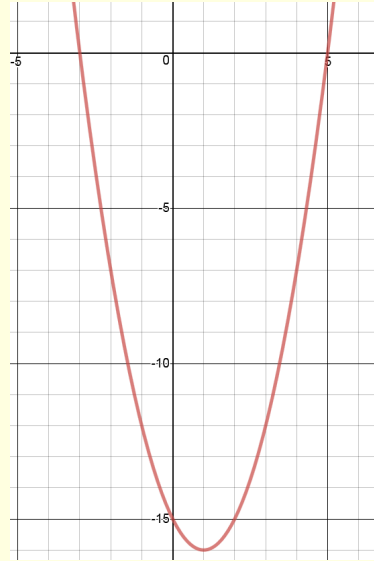


Stating the Equation given the Roots

1) A parabola has roots $(-3, 0)$ and $(5, 0)$. Find the equation of the parabola.

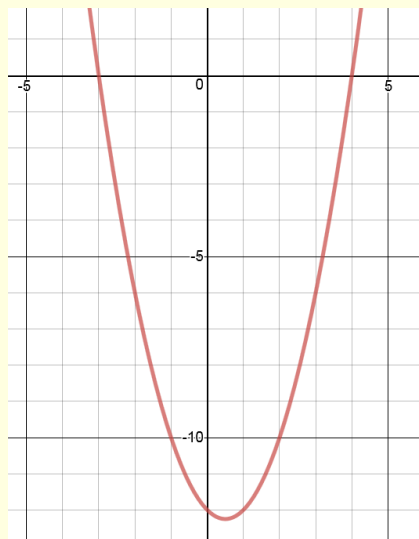
Stating the Equation given the Roots

1) A parabola has roots $(-3, 0)$ and $(5, 0)$. Find the equation of the parabola.



Stating the Equation given the Roots

2) A parabola has roots $(4, 0)$ and $(-3, 0)$. Find the equation of the parabola.



Stating the Equation given the Roots



Find the equation of the parabola with roots...

1) $(1, 0)$ & $(3, 0)$

2) $(-3, 0)$ & $(7, 0)$

3) $(-5, 0)$ & $(1, 0)$

4) $(-4, 0)$ & $(4, 0)$

Challenge

5) $(0, 0)$ & $(2.5, 0)$

Answers

1) $y = x^2 - 4x + 3$

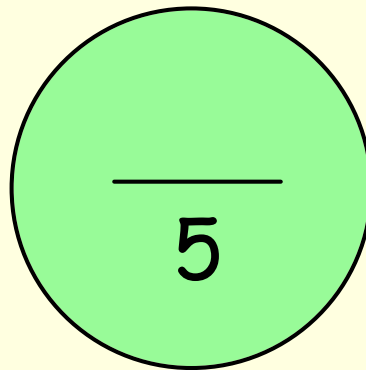
2) $y = x^2 + 4x - 21$

3) $y = x^2 + 4x - 5$

4) $y = x^2 - 16$

Challenge

5) $y = x^2 - 2.5x$



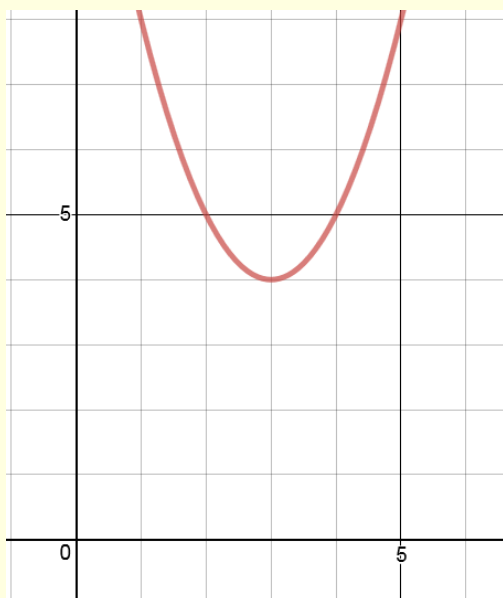
Stating the Equation given the Turning Point

If the parabola has a turning point at (a, b) it has an equation of the form...

$$y = (x - a)^2 + b$$

Stating the Equation given the Turning Point

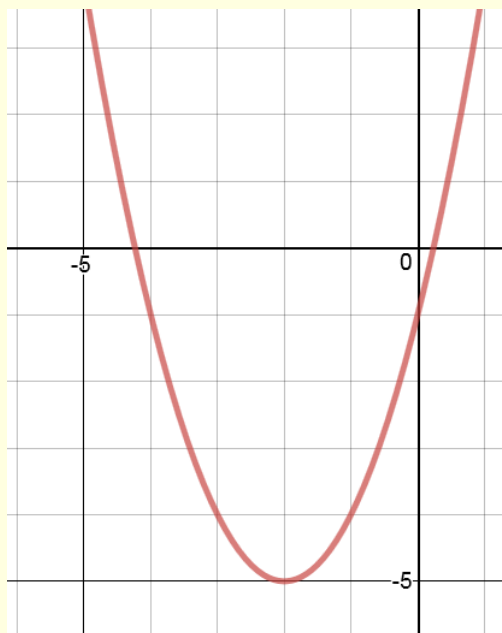
1.



Turning Point =

Stating the Equation given the Turning Point

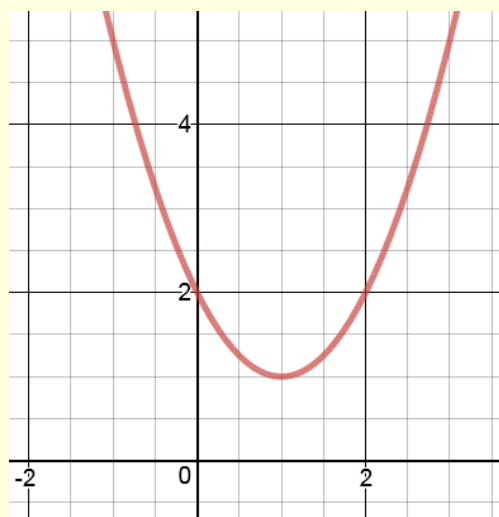
2.



Turning Point =

Stating the Equation given the Turning Point

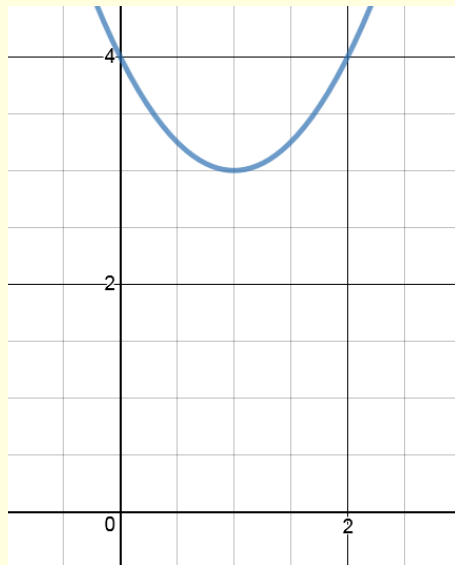
3.



Turning Point =

Stating the Equation given the Turning Point

4.



Turning Point =

Exam Style Question

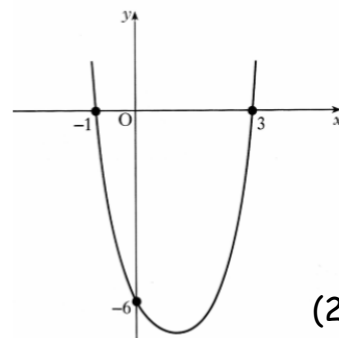
Parabolas

1. The diagram shows part of the graph of a quadratic function, with equation of the form

$$y = k(x - a)(x - b)$$

The graph cuts the y-axis at (0, -6) and the x-axis at (-1, 0) and (3, 0)

- a) Write down the values of a and b .



Exam Style Question

2. (a) Express $x^2 + 6x - 4$ in the form $(x + a)^2 + b$. 2

(b) If the graph of $y = x^2 + 6x - 4$ is drawn, what would the coordinates and nature of the turning point be? 2

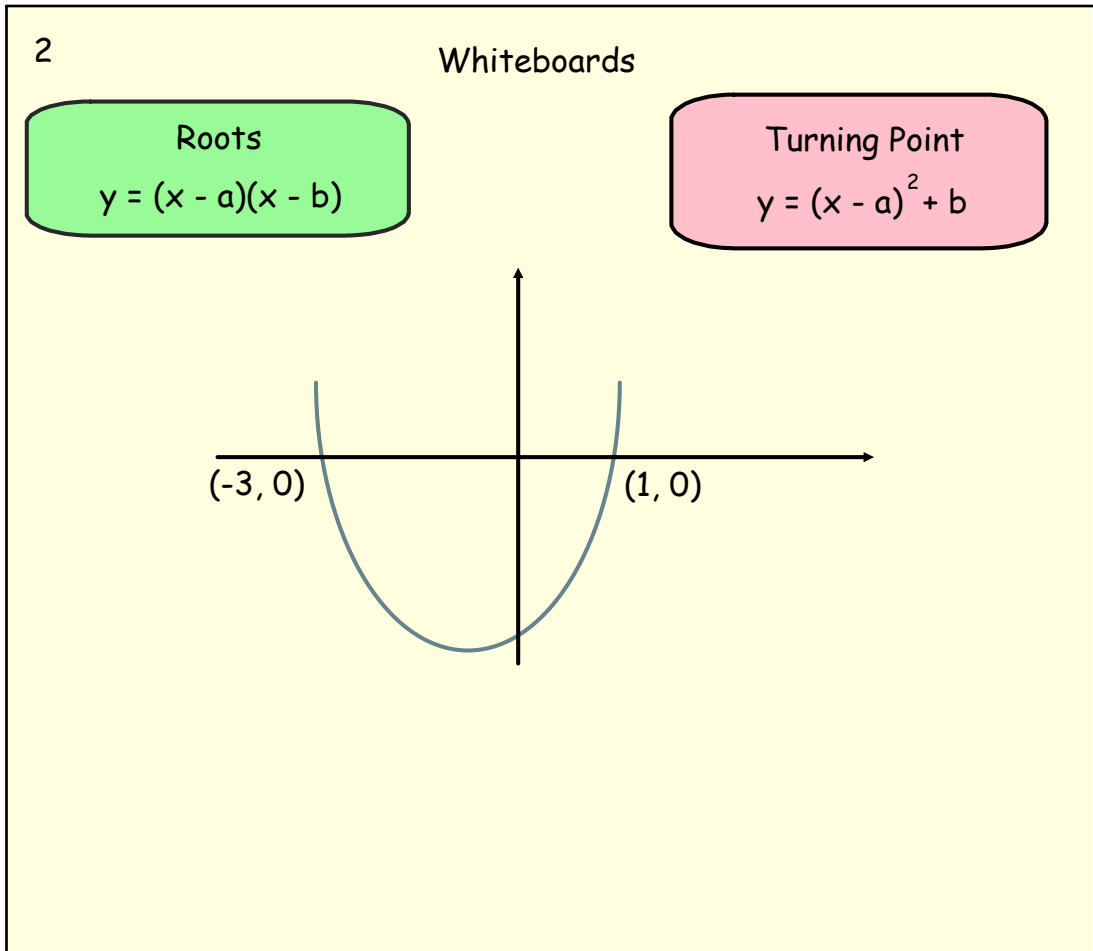
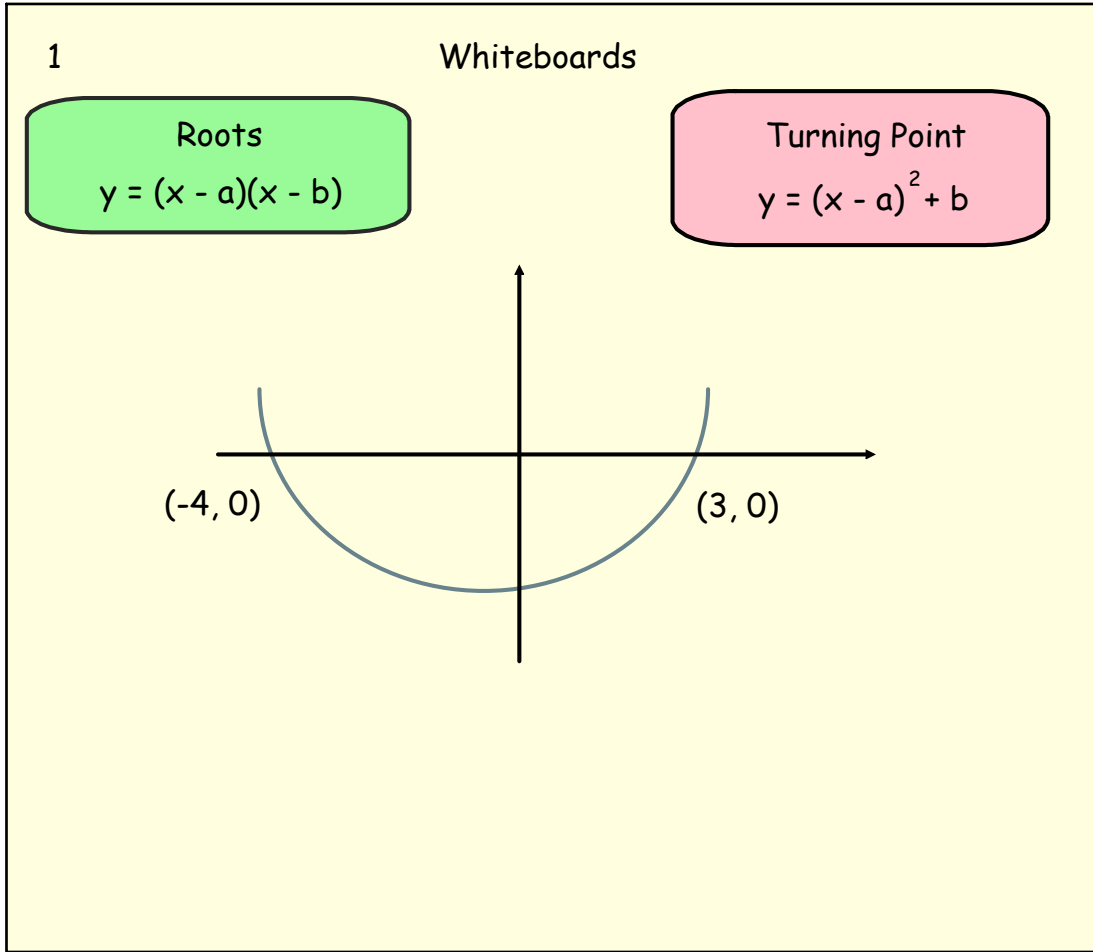
Whiteboards

Roots

$$y = (x - a)(x - b)$$

Turning Point

$$y = (x - a)^2 + b$$



3

Whiteboards

Roots
 $y = (x - a)(x - b)$

Turning Point
 $y = (x - a)^2 + b$

A Cartesian coordinate system showing a parabola opening upwards. The x-axis has two points labeled $(-1, 0)$ and $(1, 0)$, representing the roots of the parabola. The y-axis is vertical and the x-axis is horizontal.

4

Whiteboards

Roots
 $y = (x - a)(x - b)$

Turning Point
 $y = (x - a)^2 + b$

A Cartesian coordinate system showing a parabola opening upwards. The x-axis has two points labeled $(-7, 0)$ and $(0, 0)$, representing the roots of the parabola. The y-axis is vertical and the x-axis is horizontal.

5 Whiteboards

Roots
 $y = (x - a)(x - b)$

Turning Point
 $y = (x - a)^2 + b$

A coordinate plane with x and y axes. A blue parabola opens upwards. A black dot marks the vertex at the coordinates $(-3, -1)$. A green rounded rectangle on the left contains the text "Roots" and the equation $y = (x - a)(x - b)$. A pink rounded rectangle on the right contains the text "Turning Point" and the equation $y = (x - a)^2 + b$. A thin black line connects the vertex point to the pink box.

6 Whiteboards

Roots
 $y = (x - a)(x - b)$

Turning Point
 $y = (x - a)^2 + b$

A coordinate plane with x and y axes. A blue parabola opens upwards. A black dot marks the vertex at the coordinates $(4, 2)$. A green rounded rectangle on the left contains the text "Roots" and the equation $y = (x - a)(x - b)$. A pink rounded rectangle on the right contains the text "Turning Point" and the equation $y = (x - a)^2 + b$. A thin black line connects the vertex point to the pink box.

7

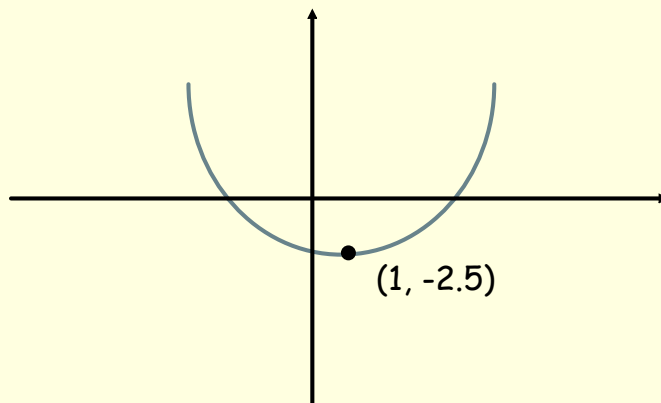
Whiteboards

Roots

$$y = (x - a)(x - b)$$

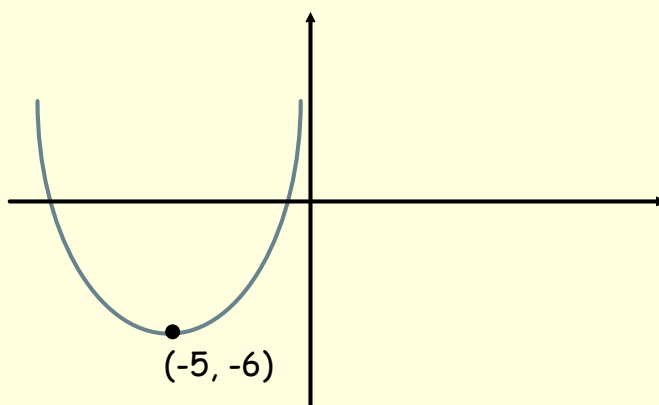
Turning Point

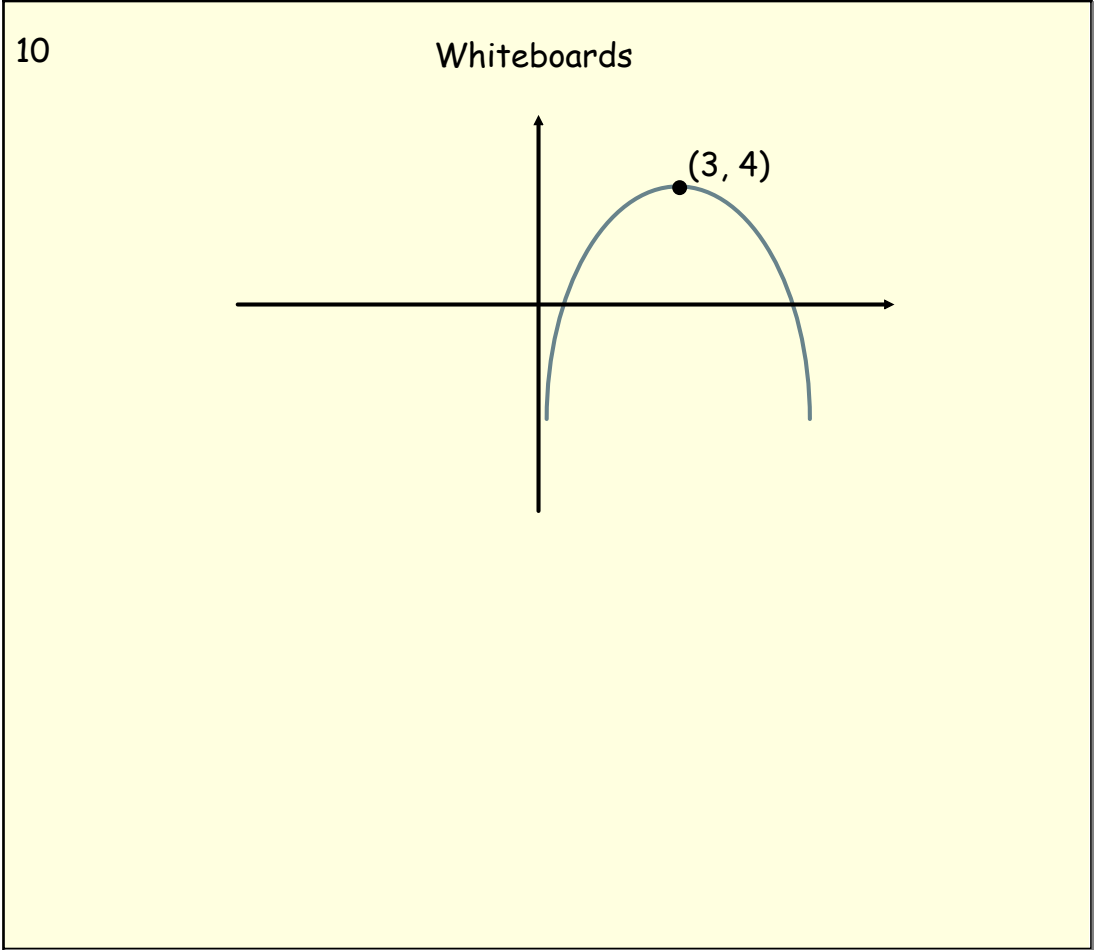
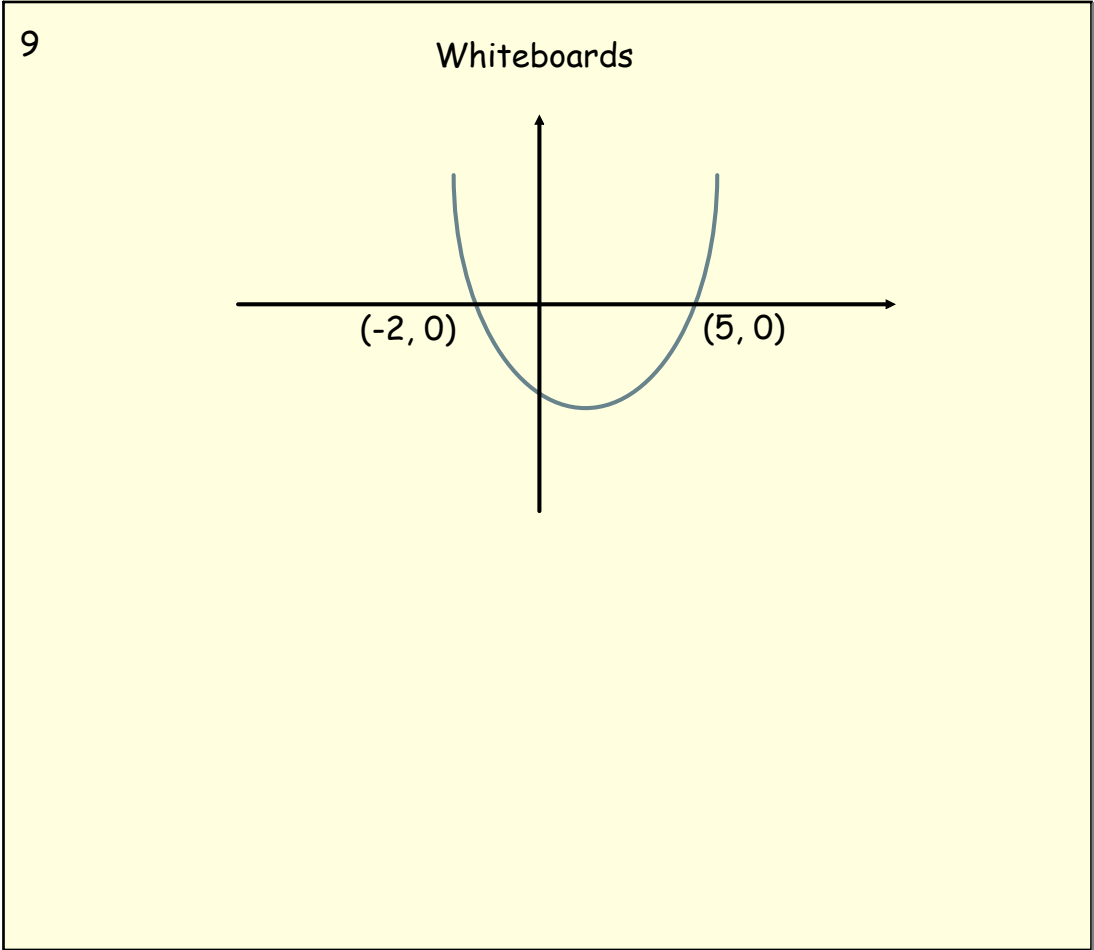
$$y = (x - a)^2 + b$$



8

Whiteboards





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