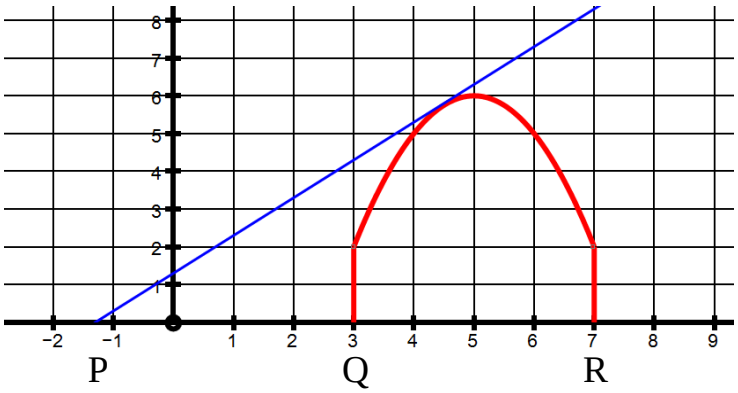
EXCELLENCE PRACTICE.

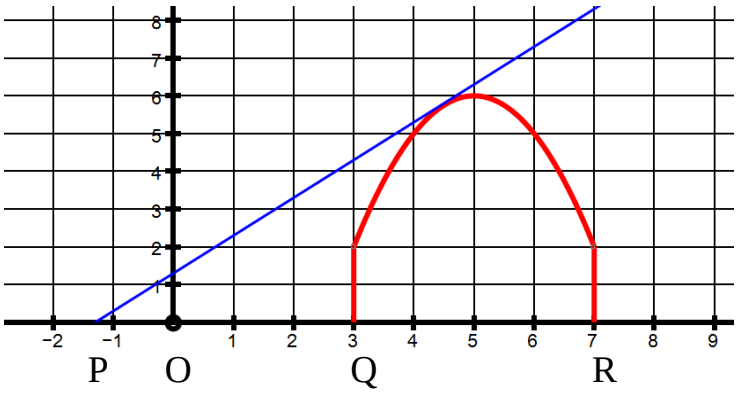


(a) Find the equation of the parabola.

(b) The line has a gradient of 1 and is a tangent to the parabola.
The equation of the tangent is ***y = x + c where c is not yet known.***
Find the value of ***c.***

(c) Point P is where the line crosses the ***x axis***.
Point Q is at (3, 0)
Find the distance PQ

EXCELLENCE PRACTICE. ANSWERS



(a) Find the equation of the parabola.

EQU is of the form $y = -b(x - 5)^2 + 6$

Subs (3, 2) $2 = -b(3 - 5)^2 + 6$

$-4 = -b(4)$

$b = 1$

Equ is $y = -(x - 5)^2 + 6$

(b) The line has a gradient of 1 and is a tangent to the parabola.

The equation of the tangent is $y = x + c$ ***where c is not yet known.***

Find the value of ***c.***

Intersection is when $x + c = -(x - 5)^2 + 6$

$x + c = -(x^2 - 10x + 25) + 6$

$x + c = -x^2 + 10x - 19$

$x^2 - 9x + (c + 19) = 0$

The line is a tangent so $) = 0$

$9^2 - 4(c + 19) = 0$

$81 - 4c - 76 = 0$

$5 = 4c$

$\frac{5}{4} = c$

Tangent is $y = x + 1.25$

(c) Point P is where the line crosses the ***x axis***.

Point Q is at (3, 0)

Find the distance PQ

y = x + 1.25 crosses x axis when y = 0

$0 = x + 1.25$

So $x = -1.25$

Distance PO = + 1.25 (cant have a negative distance!)

OQ = 3

So PQ = 4.25