Name: _____ 5-a-day Higher Plus

13th May

Corbettmaths

James has solved the equation
$x^2 + ax + b = 0$ $a=1$ $b=a$ $c=b$

His solutions are $x = -3 + \sqrt{17}$ and $x = -3 - \sqrt{17}$

$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Find a and b

$\frac{-a \pm \sqrt{a^2 - 4b}}{2}$

$\frac{-a}{2} = -3$

$-a = -6$

$a = 6$

$\frac{\sqrt{36-4b}}{2} = \sqrt{17}$

$\sqrt{36-4b} = \sqrt{68}$

$b = -8$

Solve

$$\frac{81^x}{9^{x+1}} = 3\sqrt{3}$$

$\frac{(3^4)^x}{(3^2)^{x+1}} = 3^{1.5}$

$\frac{3^{4x}}{3^{2x+2}} = 3^{1.5}$

$4x - (2x+2) = 1.5$

$4x - 2x - 2 = 1.5$

$2x = 3.5$

$x = 1.75$

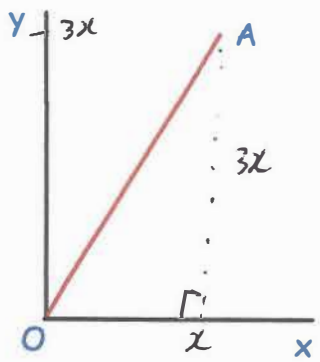
Jim picks a five digit odd number. 1 3 5 7 9
The second digit is less than 5. 0 1 2 3 4
The fourth digit is a cube number 1 8
The first digit is a prime number. 2 3 5 7

How many different numbers could he pick?

1st 2nd 3rd 4th 5th

$4 \times 5 \times 10 \times 2 \times 5$

2000



The line OA has a gradient of 3
The length of OA is $12\sqrt{10}$

Work out the coordinates of A

$x^2 + (3x)^2 = (12\sqrt{10})^2$

$x^2 + 9x^2 = 1440$

$10x^2 = 1440$

$x^2 = 144$

$x = \pm 12$

(12, 36)

or (-12, -36) → not for the picture given.