Name: _____ 5-a-day Higher Plus

12th January

Corbettmaths

Solve the simultaneous equations

$x = 3y + 6$ ①
$3xy = 24 - x$ ②

sub ① into ②

$3(3y+6)y = 24 - (3y+6)$
$(9y + 18)y = 24 - 3y - 6$
$9y^2 + 18y = 24 - 3y - 6$
$9y^2 + 21y - 18 = 0$ $(3y-2)(y+3)$
$3y^2 + 7y - 6 = 0$ $y = \frac{2}{3}$ $y = -3$

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

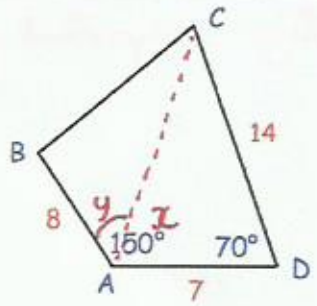
$x = 8$ $x = -3$

Write $x^2 + 8x + 17$ in the form $(x + a)^2 + b$

$= (x + 4)^2 + 1$

Find the coordinates of the turning point of $y = x^2 + 8x + 17$

Turning point = $(-4, 1)$



Calculate the length BC.

$AC^2 = 7^2 + 14^2 - 2 \times 7 \times 14 \times \cos 70$
$AC^2 = 177.91...$
$AC = 13.34...$

$\frac{\sin x}{14} = \frac{\sin 70}{13.34...}$
$x = 80.46$

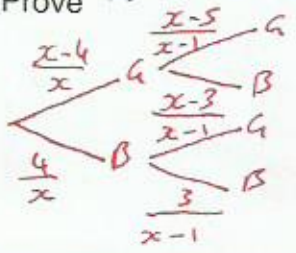
$y = 150 - 80.46 = 69.54$
$BC^2 = 8^2 + 13.34^2 - 2 \times 8 \times 13.34 \times \cos 69.54...$
$BC = 12.94 cm$

There are x apples in a crate.
4 of the apples are bad.

At start:
Bad: 4
Good: $x - 4$

Fiona chooses two apples from the crate, without replacement.
The probability she selects two bad apples is $^1/_{11}$

Prove $x^2 - x - 132 = 0$



Find x, the number of apples in the crate.

$(x - 12)(x + 11) = 0$
$x - 12 = 0$ $x + 11 = 0$
$x = 12$ $x = -11$
Must be positive $\therefore x = 12$.

$P(bad, bad) = \frac{4}{x} \times \frac{3}{x-1} = \frac{1}{11}$

$\frac{12}{x^2 - x} = \frac{1}{11}$
$132 = x^2 - x$
$x^2 - x - 132 = 0$ QED