Name: _____ 5-a-day Further Maths

8th April

Corbettmaths

Solve $7x^2 - 22x + 16 = 0$

$(7x - 8)(x - 2) = 0$

$x = \frac{8}{7}$ or $x = 2$

Given n is a positive even integer,

prove that $3n^2 + 6n$ is divisible by 12

$n = 2k$

$3(2k)^2 + 6(2k)$

$3(4k^2) + 12k$

$12k^2 + 12k$

$12k(k+1)$

~~$k(k+1)$ = odd × even = even~~

$12k(k+1)$ is divisible by 12 QED.

A curve has equation $y = x^2(5 - x)$

Find the gradient of the normal to the curve at the point $(1, 4)$

$y = 5x^2 - x^3$

$\frac{dy}{dx} = 10x - 3x^2$

$x = 1$ $\frac{dy}{dx} = 7$

$-\frac{1}{7}$

The coefficient of the x^3 term in the expansion of $(2x + a)^5$ is 1280

Find the possible values of a

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1

$10 \times (2x)^3 \times a^2 = 1280x^3$

$10 \times 8x^3 \times a^2 = 1280x^3$

$80a^2x^3 = 1280x^3$

$a^2 = 16$

$a = 4$ or $a = -4$

The line L has equation $5x - 2y + 17 = 0$

The line L intersects the x-axis at the point A. The line L intersects the y-axis at the point B.

Find the distance between the points A and B.

9.155

$-2y + 17 = 0$ $(0, 8.5)$

$2y = 17$

$y = 8.5$

$5x = -17$ $(-3.4, 0)$

$x = -3.4$

$\sqrt{8.5^2 + 3.4^2}$

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