Name: _____ 5-a-day Further Maths

17th February

Corbettmaths

Factorise fully

$30xy^5z - 24x^2y^3z^2 + 12x^3y^3z$

$6xy^3z(5y^2 - 4xz + 2x^2)$

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The first 5 terms of a quadratic sequence are

36 30 22 12 0

Find an expression for the nth term

$-n^2 - 3n + 40$

36 30 22 12 0

-6 -8 -10 -12

-2 -2 -2

$2a = -2$

$a = -1$ $3a + b = -6$

$b = -3$

$a + b + c = 36$ $c = 40$

A curve has equation $y = (x + 2)(x - 3)$

The gradient of the curve at point P is –4

Work out the coordinates of the point P.

$y = x^2 - x - 6$

$dy/dx = 2x - 1$

$2x - 1 = -4$

$2x = -3$

$x = -\frac{3}{2}$ $\left(-\frac{3}{2}, -\frac{9}{4}\right)$

Rationalise the denominator

$\frac{7 + \sqrt{6}}{3 + \sqrt{6}} \times \frac{(3 - \sqrt{6})}{(3 - \sqrt{6})} = \frac{21 - 4\sqrt{6} - 6}{9 - 6}$

$= \frac{15 - 4\sqrt{6}}{3}$

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Show that

$(\sin\theta + \cos\theta)^2 + (\sin\theta - \cos\theta)^2 \equiv 2$

LHS

$\sin^2\theta + 2\sin\theta\cos\theta + \cos^2\theta$

$+ (\sin^2\theta - 2\sin\theta\cos\theta + \cos^2\theta)$

$= 2\sin^2\theta + 2\cos^2\theta$

$= 2(\sin^2\theta + \cos^2\theta)$

$= 2$