Name: _____ 5-a-day Further Maths

9th October

Corbettmaths

The nth term of a sequence is

$$\frac{8n^2-1}{9n^2-7}$$

Write down the limiting value of the sequence $n \to \infty$

$$= \frac{8-\frac{1}{n^2}}{9-\frac{7}{n^2}} \to \frac{8}{9}$$

Make x the subject of

$$y = \sqrt{\frac{x+4}{x-7}} + 10 \qquad (y > 10)$$

$$(y-10)^2 = \frac{x+4}{x-7}$$

$$x(y-10)^2 - 7(y-10)^2 = x+4$$

$$x(y-10)^2 - x = 7(y-10)^2 + 4$$

$$x(y^2-20y+99) = 7y^2-140y+704$$

$$x = \frac{7y^2-140y+704}{y^2-20y+99}$$

The lengths of the three sides of a triangle are 7.2cm, 8cm and 10.4cm

Find the largest angle in the triangle.

$$10.4^2 = 7.2^2 + 8^2 - 2\times 7.2\times 8\times\cos\theta$$

$$108.16 = 115.84 - 115.2\cos\theta$$

$$115.2\cos\theta = 7.68$$

$$\cos\theta = \frac{1}{15}$$

$$\theta = 86.2^\circ$$

Work out the equation of the normal to the curve $y = x^3 - 4x + 1$ at the point where $x = -2$

$$\frac{dy}{dx} = 3x^2 - 4$$

$$x = -2 \Rightarrow \frac{dy}{dx} = 8, \; y = 1$$

Normal is $y - 1 = -\frac{1}{8}(x+2)$

$$y = -\frac{1}{8}x + \frac{3}{4}$$