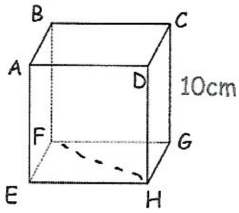
1st May

Corbettmaths

Shown below is a cube with side length 10cm



$FH = \sqrt{10^2 + 10^2}$

$FH = \sqrt{200}$

$BH^2 = FH^2 + BF^2$

$= 200 + 100$

Work out the length of BH

$\sqrt{300} = 10\sqrt{3}$ cm

17.32 cm

P is the point (7, –5) on the circle
$(x-5)^2 + (y+3)^2 = 8$

$(5, -3)$

Work out the equation of the tangent to the circle at P.

gradient (radius) $= \frac{-2}{2} = -1$

gradient (tangent) $= 1$

$y = x + c$

$-5 = 7 + c$

$c = -12$

$y = x - 12$

The nth term of a sequence is
$n^2 - 8n + 31$

By using completing the square, show that every term is positive.

$(n-4)^2 - 16 + 31$

$(n-4)^2 + 15$

$(n-4)^2 \geq 0$ always

$(n-4)^2 + 15 > 0$ ∴ positive

Prove that

$$tan^2\theta - \frac{1}{cos^2\theta} \equiv -1$$

LHS

$\frac{\sin^2\theta}{\cos^2\theta} - \frac{1}{\cos^2\theta} = \frac{\sin^2 - 1}{\cos^2\theta}$

$= \frac{-1(1-\sin^2\theta)}{\cos^2\theta}$

$= \frac{-\cos^2\theta}{\cos^2\theta}$

$= -1$

QED

$$y = \frac{4x^7 - x^5}{2x}$$

Work out $\frac{d^2y}{dx^2}$

$y = 2x^6 - \frac{1}{2}x^4$

$\frac{dy}{dx} = 12x^5 - 2x^3$

$\frac{d^2y}{dx^2} = 60x^4 - 6x^2$

$60x^4 - 6x^2$