6th January

Corbettmaths

Use factor theorem to show that $(x-4)$ is a factor of x^3+x^2-20x

Let $f(x) = x^3+x^2-20x$

$f(4) = 64+16-80$

$= 0$

$\therefore (x-4)$ is a factor.

Solve the simultaneous equations

$2x+4y-z=15$ — (1)

$3x+8y+z=44$ — (2)

$x+2y+2z=15$ — (3)

(1) + (2) $5x+12y=59$ — (4)

(3) + 2×(1) $5x+10y=45$ — (5)

(5) − (4) $-2y=-14$

$y=7$

$4x+8y-2z=30$

add $x+2y+2z=15$

$5x+10y=45$

sub $y=7$ into (5)

$5x+70=45$

$5x=-25$

$x=-5$

sub $x=-5$, $y=7$ into (1)

$-10+28-z=15$

$-z=-3$

$z=3$

A curve has equation $y=x^2+2x$

Find the gradient of the normal to the curve at the point $(1, 3)$

$\frac{dy}{dx} = 2x+2$

$x=1$ $\frac{dy}{dx}=4$

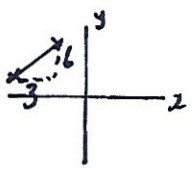
gradient of normal $= -\frac{1}{4}$

A circle has equation $(x+7)^2+(y-6)^2=49$

Is the point $(-4, 12)$ inside or outside the circle?

Centre $(-7, 6)$

radius is 7



$\sqrt{3^2+6^2} = \sqrt{45}$

$\sqrt{45} < 7$

$\therefore$ inside circle