



26th December

Simplify fully $\frac{a^8}{a^3 \times a^{-9}}$

$$\frac{a^8}{a^{-6}} = a^{14}$$

$$f(x) = x + 9$$

$$g(x) = 5x - 1$$

Find $gf(x)$

$$5(x+9) - 1$$

$$5x + 45 - 1$$

$$gf(x) = 5x + 44$$

Factorise $5x^2 - 13xy - 6y^2$

$$(5x + 2y)(x - 3y)$$

A curve has the equation

$$y = x^3 + ax^2 - 8 \text{ where } a \text{ is a constant.}$$

The gradient of the curve when $x = 2$ is eleven times the gradient of the curve when $x = -2$

Work out the value of a

$$\frac{dy}{dx} = 3x^2 + 2ax$$

$$x = 2 \quad \frac{dy}{dx} = 12 + 4a$$

$$x = -2 \quad \frac{dy}{dx} = 12 - 4a$$

$$11(12 - 4a) = 12 + 4a$$

$$132 - 44a = 12 + 4a$$

$$48a = 120$$

$$a = \frac{5}{2}$$