## A Simultaneous Equations

$$x + 3y - 2z = 2$$
$$2x - y + z = 3$$
$$-x + y - 2z = 2$$



## B Factorising and Simplifying

$$\frac{4(x-1)^3 + x(x-1)^2}{10x^2 - 18x + 8}$$



## C Factorising Polynomials

**Given that** $f(x) = x^3 + 3x^2 - x - 3$

**Show that (x+1) is a factor of f(x).**

## D Domain and Range

**The function f is given by f(x) = 8x +5 with the domain 5 < x < 11.**

**Work out the range of the function.**

## IMC How many of these expressions give answers which are not prime numbers?

$1^2 + 2^2$ $2^2 + 3^2$ $3^2 + 4^2$ $4^2 + 5^2$ $5^2 + 6^2$

A

## Simultaneous Equations

$$x + 3y - 2z = 2$$

$$2x - y + z = 3$$

$$-x + y - 2z = 2$$

**B** **Factorising and Simplifying**

$$\frac{4(x-1)^3 + x(x-1)^2}{10x^2 - 18x + 8}$$

C

## Equations with indices

**Solve** $9x^{\frac{3}{2}} = \frac{4}{\sqrt{x}}$

$$9x^{\frac{3}{2}} = \frac{4}{\sqrt{x}}$$

$$9x^{\frac{3}{2}} \times x^{\frac{1}{2}} = 4$$

$$9x^{\frac{4}{2}} = 4$$

$$9x^2 = 4$$

$$x^2 = \frac{4}{9}$$

$$x = \pm\frac{2}{3}$$

**D**

## Domain and Range

**The function f is given by f(x) = 5 - 3x with the domain -5 < x < 7.**

**Work out the range of the function.**

$$f(x) = 5 - 3x$$

$$f(-5) = 5 - 3(-5)$$

$$= 5 + 15$$

$$= 20$$

$$f(x) = 5 - 3x$$

$$f(7) = 5 - 3(7)$$

$$= 5 - 21$$

$$= -16$$

$$-16 < f(x) < 20$$

**IMC** **What is the difference between the largest two digit prime and the smallest two digit prime?**

$$97 - 11 = 86$$