

M4 = 28 days to go!

$$4500 = 2^a \times 9 \times 5^b$$

3 (a) Given that $4500 = 2^a \times 3^2 \times 5^b$

work out the values of a and b .

$$\begin{aligned} 500 &= 2^a \times 5^b \\ &= 2 \times 2 \times 5 \times 5 \times 5 \end{aligned}$$

Answer $a = \underline{2}$ $b = \underline{3}$ [3]

(b) Hence, write down the lowest value by which 4500 needs to be multiplied to make a cube number.

$$2^2 \times 3^2 \times 5^3$$

Answer 6 [2]

For a cube number each index must be multiple of 3 so must get to

$$2^3 \times 3^3 \times 5^3$$

so multiply by 2×3

13 Simplify fully

$$\frac{3x^2 - 6xy}{4x^2 - 8xy - 3xy + 6y^2}$$

$$\frac{3x(x-2y)}{(4x-3y)(x-2y)}$$

$$(4x-3y)(x-2y)$$

These will cancel so look to factorise and look for similar

A very tricky question

Answer $\frac{3x}{4x-3y}$ [2]

19 A is a fraction whose denominator is 3 more than its numerator.

A new fraction B is produced.

4 is added to the numerator of A to give the numerator of B.

4 is added to the denominator of A to give the denominator of B.

Fraction B is now larger than fraction A by $\frac{1}{8}$

By setting up and solving a suitable equation find the original fraction A.

A method of trial and improvement will not be accepted.

$$A = \frac{n}{n+3}$$

$$B = \frac{n+4}{n+7}$$

$$B - A = \frac{1}{8}$$

$$\frac{n+4}{n+7} - \frac{n}{n+3} = \frac{1}{8}$$

$$\frac{(n+4)(n+3) - n(n+7)}{(n+7)(n+3)} = \frac{1}{8}$$

$$\frac{n^2 + 7n + 12 - n^2 - 7n}{(n+7)(n+3)} = \frac{1}{8}$$

$$\frac{12}{(n+7)(n+3)} = \frac{1}{8}$$

$$(n+7)(n+3) = 96$$

Really tough question!

$$n^2 + 10n + 21 - 96 = 0$$

$$n^2 + 10n - 75 = 0$$

$$(n+15)(n-5) = 0$$

$$n = -15 \quad n = 5$$

Answer

Original Fraction

[8]

$$\frac{5}{8}$$

but $\frac{-15}{-12}$ is also correct