

Sample problems

1. Find the cube root of $2^6 \times 5^{12} \times 7^3$.

2. Consider the following numbers:

$$0, \sqrt{16}, \frac{2}{\sqrt{5}}, \frac{\pi}{3\pi}, -2^3, 13, \frac{\sqrt{2}}{(\sqrt{2})^3}$$

Write down the:

- (i) irrational numbers
- (ii) negative integers
- (iii) prime numbers

3. Simplify the following.

- (a) $x(x + 2) - 2(x + 4)$
- (b) $5(a + b) - 5(a - b)$

4. Solve for x

- (a) $2(x + 4) - 5x = 12$
- (b) $3x(2x + 6) - 18x = \frac{6}{49}$

5. Given that $a = 2$, $b = -2$ and $c = \frac{1}{4}$, evaluate

- (a) $a^2 + b^2 + 2c$
- (b) $\frac{(a+b-c)^2}{a+b-c}$

6. ABC and DEF are similar triangles such that $\frac{AB}{DE} = \frac{1}{4}$ and $\frac{[ABC]}{[DEF]} = \frac{k}{k+30}$.

Find the value of k .

7. The volume of a cylinder is $250\pi \text{ cm}^3$. If the height of the cylinder is twice as long as its radius, find out the radius of the cylinder.

8. Find the ratio of the interior angle of a 24-sided regular polygon to that of a 12-sided regular polygon.

9. A cuboid can be cut exactly into 2-cm cubes or 3-cm cubes. The volume of the cuboid is 1728 cm^3 . Find out the biggest possible total surface area of the cuboid.

10. x and y are real numbers such that:

$$\frac{2x + 3y}{3x + 2y} = \frac{4}{5}$$

Find the ratio $x : y$.