Polynomials

1. Show that $x - 4$ is a factor of $2x^2 - 11x + 12$ and hence factorise fully.

2. Factorise fully $x^3 - 11x^2 + 26x - 16$

3. If $x + 3$ is a factor of $x^3 + kx^2 + 7x + 3$, find k and hence factorise fully.

4. Show that $x = 2$ is a root of the equation $x^3 + 5x^2 - 4x - 20 = 0$ and find the other roots.

5. Find the points where the curve $y = x^3 + 10x^2 - 9x - 90$ cuts the coordinate axes.

6. Factorise fully $x^3 + 2x^2 - x - 2$

7. If $x - 1$ is a factor of $x^3 - 3x^2 + kx - 1$, find k and hence factorise fully.

8. Show that $x = 1$ is a root of the equation $x^3 - 9x^2 + 20x - 12 = 0$ and find the other roots.

9. Show that $x = -4$ is a root of the equation $6x^3 + 25x^2 + 2x - 8 = 0$ and find the other roots.

10. If $x - 2$ is a factor of $f(x) = 2x^3 + kx^2 + 7x + 6$, find k and hence solve the equation $f(x) = 0$.

11. The same remainder is obtained when $x^2 + 3x - 2$ and $x^3 - 4x^2 + 5x + p$ are divided by $x + 1$. Find p.

Answers

1. $(x - 4)(2x - 3)$

2. $(x - 1)(x - 2)(x - 8)$

3. $k = 5$ $(x + 3)(x + 1)^2$

4. $x = -2$ or $x = 2$ or $x = -5$

5. $(-10,0)$ $(-3,0)$ $(3,0)$ and $(0,90)$

6. $(x - 1)(x + 1)(x + 2)$

7. $k = 3$ $(x-1)^3$

8. $x = 1$ or $x = 2$ or $x = 6$

9. $x = -4$ or $x = \dfrac{1}{2}$ or $x = -\dfrac{2}{3}$

10. $k = -9$ $\qquad x = -\dfrac{1}{2}$ or $x = 2$ or $x = 3$

11. $p = 6$