

Cubics : 4 : Past Paper Examples

1) The polynomial

$$f(x) = px^3 - x^2 + qx - 6$$

has $x-3$ as a factor. When $f(x)$ is divided by $x-2$ the remainder is -20 .

- a) show that $p=2$ and find q
- b) factorise $f(x)$

2) When $9x^3 + 6x^2 - 5x + p$ is divided by $x-1$ the remainder is 8 .

- a) show that $p = -2$
- b) factorise $9x^3 + 6x^2 - 5x - 2$

3) a) Given that $x-3$ is a factor of $x^3 - 5x^2 - 2x + p$, show $p = 24$

b) solve $x^3 - 5x^2 - 2x + 24 = 0$

c) find the remainder when $x^3 - 5x^2 - 2x + 24$ is divided by $x-2$

4) a) When $6x^3 + ax^2 - 3x - 2$ is divided by $x+2$ the remainder is -24 . show $a = 5$.

b) Factorise

$$6x^3 + 5x^2 - 3x - 2$$

5) The polynomial $4x^3 + px^2 - 11x + q$ has $x-2$ as a factor. When divided by $x+1$ the remainder is 9 .

a) show $p = -4$ and $q = 6$

b) Factorise $4x^3 - 4x^2 - 11x + 6$

6) a) When $ax^3 - 12x^2 - 6x + 5$ is divided by $x+1$ the remainder is -3 . Find a .

b) Factorise $8x^3 - 14x^2 - 7x + 6$

7) $f(x)$ is defined by $f(x) = 2x^3 + 11x^2 + 4x - 5$

a) (i) Evaluate $f(-2)$

(ii) Hence write down one fact you can deduce about $f(x)$

b) Solve the equation $f(x) = 0$

8) a) Find the remainder when $x^3 - 3$ is divided by $x+2$.

b) Solve $6x^3 + x^2 - 11x - 6 = 0$

- 9) a) Given that $x+2$ is a factor of $12x^3+kx^2-13x-6$ write down an equation satisfied by k . Hence show that $k=19$

b) Factorise $12x^3+19x^2-13x-6$

c) Find the remainder when $12x^3+19x^2-13x-6$ is divided by $2x-1$

- 10) The polynomial $px^3-x^2-31x+q$ has $x+2$ as a factor. When the polynomial is divided by $x-1$ the remainder is -36

a) show $p=6$ and $q=-10$

b) Factorise $6x^3-x^2-31x-10$

- 11) a) When $ax^3-21x-10$ is divided by $x-3$ the remainder is 35 .

Show that $a=4$

b) Factorise $4x^3-21x-10$

12) a) Solve $6x^3-19x^2+11x+6=0$

b) When x^3-53 is divided by $x-a$ the remainder is 11 . Find the value of a .

- 13) a) Given that $x+2$ is a factor of px^3+18x^2-4x-8 write down an equation satisfied by p . Hence show that $p=9$

b) Solve $9x^3+18x^2-4x-8=0$