projectmaths

Polynomials - Prel

17 **1** Which polynomial is a factor of $x^3 - 5x^2 + 11x - 10$? **1** Solution

(A) $x - 2$ (B) $x + 2$ (C) $11x - 10$ (D) $x^2 - 5x + 11$

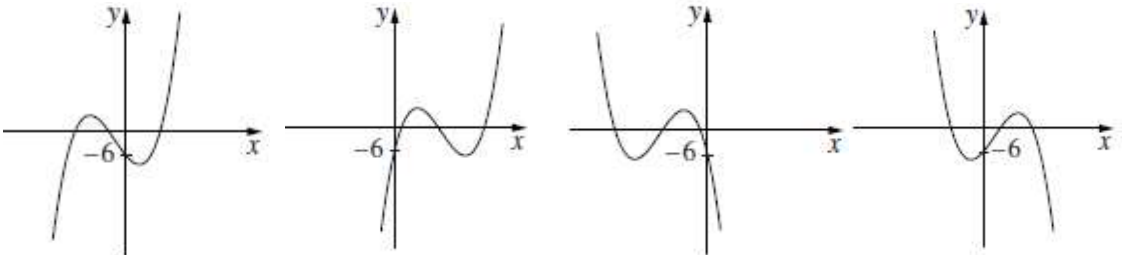
16 **2** What is the remainder when $2x^3 - 10x^2 + 6x + 2$ is divided by $x - 2$? **1** Solution

(A) −66 (B) −10

(C) $-x^3 + 5x^2 - 3x - 1$ (D) $x^3 - 5x^2 + 3x + 1$

16 **10** Consider the polynomial $p(x) = ax^3 + bx^2 + cx + d$ with a and b positive. Which graph could represent $p(x)$? **1** Solution

(A) (B) (C) (D)



15 **1** What is the remainder when $x^3 - 6x$ is divided by $x + 3$? **1** Solution

(A) −9 (B) 9 (C) $x^2 - 2x$ (D) $x^2 - 3x + 3$

15 **11** Consider the polynomials $P(x) = x^3 - kx^2 + 5x + 12$ and $A(x) = x - 3$. Solution

f (i) Given that $P(x)$ is divisible by $A(x)$, show that $k = 6$. **1**

(ii) Find all the zeros of $P(x)$ when $k = 6$. **2**

14 **5** Which group of three numbers could be the roots of the polynomial equation $x^3 + ax^2 - 41x + 42 = 0$? **1** Solution

(A) 2, 3, 7 (B) 1, −6, 7 (C) −1, −2, 21 (D) −1, −3, −14

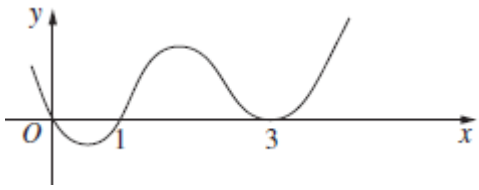
14 **9** The remainder when the polynomial $P(x) = x^4 - 8x^3 - 7x^2 + 3$ is divided by $x^2 + x$ is $ax + 3$. What is the value of a? **1** Solution

(A) −14 (B) −11 (C) −2 (D) 5

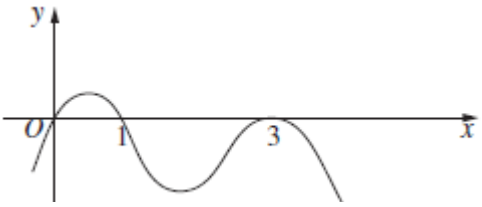
13 **1** The polynomial $P(x) = x^3 - 4x^2 - 6x + k$ has a factor $x - 2$. What is the value of k? **1** Solution

(A) 2 (B) 12 (C) 20 (D) 36

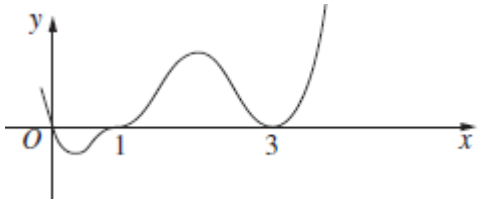
13 **4** Which diagram best describe the graph of $y = x(1 - x)^3(3 - x)^2$? **1** Solution



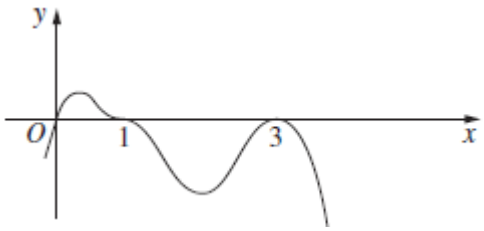
(A)



(B)



(C)



(D)

13 **11 a** The polynomial equation $2x^3 - 3x^2 - 11x + 7 = 0$ has roots α, β and γ. Find $\alpha\beta\gamma$. **1** Solution

12 **8** When the polynomial $P(x)$ is divided by $(x + 1)(x - 3)$, the remainder is $2x + 7$. What is the remainder when $P(x)$ is divided by $x - 3$?
(A) 1 (B) 7 (C) 9 (D) 13 **1** Solution

11 **2a** Let $P(x) = x^3 - ax^2 + x$ be a polynomial, where a is a real number. When $P(x)$ is divided by $x - 3$ the remainder is 12.
Find the remainder when $P(x)$ is divided by $x + 1$. **3** Solution

10 **2c** Let $P(x) = (x + 1)(x - 3)Q(x) + ax + b$ where $Q(x)$ is a polynomial and a and b are real numbers. The polynomial $P(x)$ has a factor of $x - 3$.
When $P(x)$ is divided by $x + 1$ the remainder is 8. Solution
(i) Find the values of a and b. **2**
(ii) Find the remainder when $P(x)$ is divided by $(x + 1)(x - 3)$. **1**

09 **2a** The polynomial $p(x) = x^3 - ax + b$ has a remainder of 2 when divided by $(x - 1)$ and a remainder of 5 when divided by $(x + 2)$.
Find the values of a and b. **3** Solution