

## Polynomial Puzzles

1. Determine the value(s) of  $k$  so that the binomial is a factor of the polynomial.  $(x^2 - 8x - 20) \div (x + k)$
2. Determine the value(s) of  $k$  so that the binomial is a factor of the polynomial.  $(x^2 - 3x - k) \div (x - 7)$
3. When  $2x^4 - x^3 - 3x^2 + x - p$  is divided by  $x - 2$ , the remainder is 0. What is the value of  $p$ ?
4. When  $(x^3 - kx - 6)$  is divided by  $(x - 4)$  the remainder is 30. Determine the value of  $k$ .
5. This polynomial has a factor of  $x - 3$ . What is the value of  $k$ ?  $kx^3 - 10x^2 + 2x + 3$
6. If  $x + 2$  is a factor of  $f(x) = x^3 + 3x^2 - kx + 4$ , determine the value of  $k$ .
7. This polynomial has a factor of  $x - 3$ . What is the value of  $k$ ?  $4x^4 - 3x^3 - 2x^2 + kx - 9$
8. Find  $k$ , if  $(2x^3 + x^2 - 5x + k) \div (x + 1)$  has a remainder of  $-3$ .
9. Determine the value of  $k$ , given that the remainder is 5 when  $P(x) = x^3 - 2x^2 + x + k$  is divided by  $(x - 2)$ .
10. When  $(x^3 - 4x^2 + kx - 16)$  is divided by  $(x + 2)$  the remainder is  $-52$ . What is the value of  $k$ ?
11. When  $(x^4 + kx^2 + 8)$  is divided by  $(x - 2)$  the remainder is 0. What is the value of  $k$ ?
12. When  $(x^4 + 3x^3 - kx^2 + 8x - 15)$  is divided by  $(x + 4)$  the remainder is 79. What is the value of  $k$ ?
13. When the polynomial  $3x^3 + ax^2 + bx - 9$  is divided by  $x - 2$ , the remainder is  $-5$ . What are the values of  $a$  and  $b$ ?
14. When the polynomial  $3x^3 + ax^2 + bx - 9$  is divided by  $x + 1$ , the remainder is  $-16$ . What are the values of  $a$  and  $b$ ?
15. If the polynomial  $P(x) = (x + 2)(x^2 + 2x - 1) + k$  is divisible by  $(x + 4)$ , then the value of  $k$  is
16. The graph of  $P(x) = k(x - 2)^2(x - 4)$  has a  $y$ -intercept of  $-96$ . What is the value of  $k$ ?