

Arithmetic with Polynomials - Worksheet 2

Answer Key

1. If $p(a) = 5$, is $x - a$ a factor of $p(x)$?
No, since $p(a) \neq 0$.
2. If $\frac{x^2+4x-2}{x-3} = x+7$, remainder 19, rewrite x^2+4x-2 as $q(x) \times (x-a) + p(a)$. What is a ?
 $x^2 + 4x - 2 = (x + 7)(x - 3) + 19$, and $a = 3$.
3. If $\frac{2x^2-3x+1}{x+4} = 2x - 11$, remainder -43, rewrite $2x^2 - 3x + 1$ as $q(x) \times (x - a) + p(a)$. What is a ?
 $2x^2 - 3x + 1 = (2x - 11)(x + 4) - 43$, and $a = -4$.
4. What is the remainder when $\frac{-x^2+6x+2}{x+1} = -x + 7$? Rewrite $-x^2 + 6x + 2$ as $q(x) \times (x - a) + p(a)$. What is a ?
 $-x^2 + 6x + 2 = (-x + 7)(x + 1) - 5$, and $a = -1$.
5. What does $\frac{2x^2+3x+1}{x}$ equal? Rewrite $2x^2 + 3x + 1$ as $q(x) \times (x - a) + p(a)$. What is a ?
 $2x^2 + 3x + 1 = x(2x + 3) + 1$, and $a = 0$.
6. What is $(x + 4)(x - 3)$? What is the remainder when $x^2 + x - 13$ is divided by $(x + 4)$?
 $(x + 4)(x - 3) = x^2 + x - 12$ and remainder is -1.
7. Re-write $x^2 + x - 13$ in the form $q(x) \times (x - a) + p(a)$.
 $x^2 + x - 13 = (x - 3)(x + 4) - 1$.
8. What is $(x^2 + 2x - 1)(x + 3)$? Rewrite $x^3 + 5x^2 + 5x$ in the form $q(x) \times (x + 3) + p(a)$. What are $q(x)$ and $p(a)$?
 $(x^2 + 2x - 1)(x + 3) = x^3 + 5x^2 + 5x - 3$,
 $x^3 + 5x^2 + 5x = (x^2 + 2x - 1)(x + 3) + 3$,
 $q(x) = x^2 + 2x - 1$ and $p(a) = 3$.
9. What is $(x + 4)(x + 2)$? Find the smallest whole number remainder when $x^2 + 6x + 10$ is divided by either $(x + 4)$ or $(x + 2)$.
 $(x + 4)(x + 2) = x^2 + 6x + 8$ and remainder = 2.
10. If we rewrite $x^2 - 4$ as $q(x) \times (x - a) + p(a)$, which values of a will make $p(a) = 0$?
 $a = 2$ and -2 .

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