BECA / Huson / Algebra 2: Polynomials
24 October 2023

Name: SOLUTIONS

2.5 PreQuiz: Operations on polynomials

1. Simplify the sum of these two polynomials: $(3x^3 + 5x^2 + x + 6) + (x^3 - 2x^2 + 7x - 8)$

$= 4x^3 + 3x^2 + 8x - 2$

2. Given the two functions $f(x) = 5x^3 + 8x^2 - x$ and $g(x) = x^4 + 2x^3 + x^2 - 5$, find their difference $f(x) - g(x)$ as a polynomial in standard form.

$= (5x^3 + 8x^2 - x) - (x^4 + 2x^3 + x^2 - 5)$

$= -x^4 + 3x^3 + 7x^2 - x + 5$

3. Multiply the two polynomials $f(x) = 2x + 5$ and $g(x) = 2x^2 + 3x - 1$. First complete the grid and then collect terms to find the product as a polynomial in standard form.

	$2x^2$	$+3x$	-1
$2x$	$4x^3$	$6x^2$	$-2x$
$+5$	$10x^2$	$15x$	-5

$= 4x^3 + 16x^2 + 13x - 5$

4. Using subscript notation, write a recursive formula for the sequence $5, 10, 20, 40, 80, 160, \ldots$ (*2)

$a_1 = 5$

$a_n = 2\,a_{n-1}$

5. Using subscript notation, write a recursive formula for the sequence $11, 3, -5, -13, \ldots$ (−8)

$a_1 = 11$

$a_n = a_{n-1} - 8$

6. Without a calculator, evaluate each polynomial for the given value of x.

(a) $f(x) = -x^3 + 12x^2 - x + 4$, $x = 1$

$f(1) =$ 14

(b) $g(x) = x^4 + x^3 + x^2$, $x = -1$

$g(-1) =$ 1

7. Use a calculator to find the value of $h(x) = 2x^3 - 3x^2 + 5x + 2$ for $x = -3$.

$h(-3) =$ -94

8. A polynomial A is used to model the value of an investment account. Two deposits were made which earned interest annually.

$$A(x) = 150x^4 + 300x^2$$

(a) The first deposit of \$150 was made four years ago. How much was the second deposit, and how long ago was it made?

\$300

2 years ago

(b) Find the value of $A(x)$ for $x = 1.05$ to the *nearest cent.*

$= 513.075375\ldots$

$\approx \$513.08$

(c) If the interest rate earned on the account is $r = 7\frac{1}{2}\%$ what value of x would be used in the formula?

$= 0.075$

$x = 1 + r = 1.075$

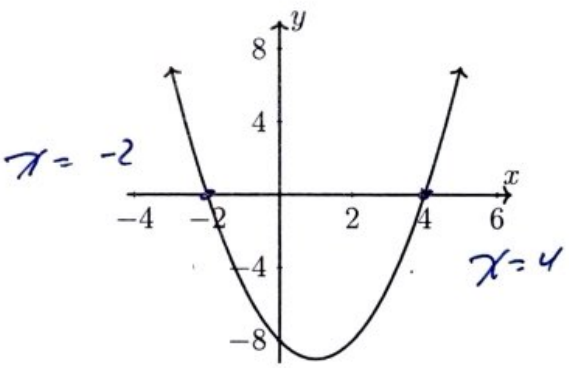
6. Select all of the expressions that are equivalent to $x^2 - 7x + 12$. $= (x-4)(x-3)$

(a) $(x-2)(x-6)$
(b) $(x-6)(x-2)$
(c) $(x+4)(x+3)$
(d) $(x-3)(x-4)$
(e) $(x-4)(x+3)$
(f) $(x+3)(x+4)$
(g) $(x-4)(x-3)$
(h) $x^2 + 7x - 12$

7. Select all solutions to the equation $(2x-1)(x+5) = 0$. $x = -5, \frac{1}{2}$

(a) $x = 0.5$
(b) $x = -5$
(c) $x = 2.5$
(d) $x = -0.5$
(e) $x = 5$
(f) $x = \frac{1}{2}$

8. Here is the graph of a quadratic function. Which of the following could be its equation?



$(x+2)(x-4)$

(a) $y = (x+2)(x-4)$
(b) $y = (x-2)(x+4)$
(c) $y = (x+2)(x+4)$
(d) $y = (x-2)(x-4)$

9. Find all of the solutions to the equation $x(x-11)(3x-8)(x+3) = 0$.

$x = 0, 11, -3, \frac{8}{3}$

$3x - 8 = 0$
$x = \frac{8}{3}$