BECA / Huson / Algebra 2: Polynomials
27 October 2023

Name: Solutions

2.7 Quiz: Operations on polynomials

1. Evaluate each polynomial for the given value of x.

   (a) $f(x) = -x^3 + 12x^2 - x + 4$, $x = 0$

   $f(0) =$ 4

   (b) $g(x) = 2x^3 + 11x^2 - 3x + 15$

   $g(-8) =$ -281

2. The polynomial function A, shown below, is used to model the value of an investment account. Three deposits were made which earned interest annually.

   $$A(x) = 200x^5 + 300x^4 + 150x^3$$

   (a) How much was the first deposit, and how long ago was it made?

   200
   5 years ago

   (b) If the polynomial is evaluated for $x = 1.04$, what interest rate would that represent *as a percentage*?

   4%

   (c) Find the value of $A(1.04)$ to the *nearest cent*.

   763.017748...
   $\approx$ \$763.02

A2-F.BF.2 Write arithmetic and geometric sequences with recursive formulas

3. Write a recursive formula for each sequence. Use subscript notation.

   (a) $3, -6, 12, -24, 48, \ldots$

   $a_1 = 3$

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

   (b) $\frac{3}{4}, \frac{5}{4}, \frac{7}{4}, \frac{9}{4}, \ldots$

   $a_1 = \frac{3}{4}$

   $a_n = a_{n-1} + \frac{1}{2}$

A1-A.APR.1 Add, subtract, and multiply polynomials

4. Find the sum in standard form $(x^3 - 4x^2 + 2x + 16) + (5x^3 - 2x^2 - 3x - 12)$

$6x^3 - 6x^2 - x + 4$

5. Find the difference $f(x) - g(x)$ as a polynomial in standard form, given $f(x) = x^4 + 2x^3 - x - 9$ and $g(x) = 2x^3 + x^2 - 3x - 11$.

$x^4 - x^2 + 2x + 2$

6. Multiply the two polynomials $f(x) = 3x - 2$ and $g(x) = x^2 - 5x + 4$. First complete the grid and then collect terms to find the product as a polynomial in standard form.

	x^2	$-5x$	4
$3x$	$3x^3$	$-15x^2$	$12x$
-2	$-2x^2$	$+10x$	-8

$= 3x^3 - 17x^2 + 22x - 8$

7. Select all of the expressions that are equivalent to $x^2 - 5x + 6$.

(a) $(x - 2)(x + 3)$
(b) $(x - 3)(x - 2)$
(c) $(x - 5)(x + 6)$
(d) $(x + 2)(x - 3)$
(e) $(x - 6)(x + 5)$
(f) $(x + 3)(x + 2)$
(g) $(x - 2)(x - 3)$
(h) $x^2 + 5x + 6$

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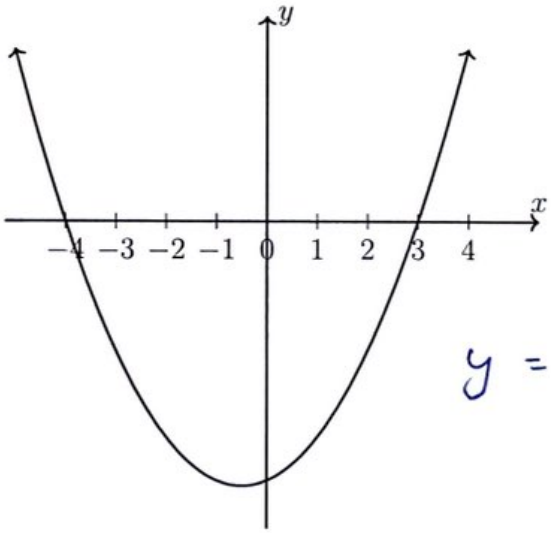
A1-A.APR.3 Identify zeros of polynomials when factorizations are available.

8. Select all solutions to the equation $(x-3)(2x+1)=0$.

$x=3, -\frac{1}{2}$

(a) $x=-\frac{1}{2}$
(b) $x=3$
(c) $x=-2$
(d) $x=-0.5$
(e) $x=-3$
(f) $x=\frac{1}{2}$

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



$y=(x-3)(x+4)$

(a) $y=(x+3)(x-4)$
(b) $y=(x-3)(x+4)$
(c) $y=(x+3)(x+4)$
(d) $y=(x-3)(x-4)$

10. Find all of the values of x that make the equation true, the solutions.

$x(x+5)(2x-9)(x-13)=0.$

$0, -5, 4\frac{1}{2}, 13$

11. Given the polynomial function $f(x) = 2x^4 + 5x^3 - x^2 + 3x - 6$.

    (a) What is the degree of the polynomial? 4

    (b) Write down the leading coefficient of f. 2

    (c) What is the value of the constant term? -6

    (d) Find $f(1)$. 3

12. The graph of a polynomial function is shown below.

    (a) Write down the x-intercepts, the solutions to $f(x) = 0$. $x = -2, 1, 4$

    (b) Write down the y-intercept as an ordered pair. $(0, 4)$

    (c) What term do we use to describe the point p on the plot? relative maximum