BECA / Huson / Algebra 2: Polynomials
15 November 2023

Name: Solutions

2.12 Pre-Exam: Polynomial functions

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

1. Find the sum in standard form $(x^3 - 7x^2 + 2x + 5) + (2x^3 + 9x^2 - 3x - 5)$

$3x^3 + 2x^2 - x$

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

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

3. Multiply the two polynomials $f(x) = 2x^2 - 3$ and $g(x) = 4x^3 - x + 1$. First complete the grid and then collect terms to find the product as a polynomial in standard form.

	$4x^3$	$-x$	1
$2x$	$8x^4$	$-2x^2$	$2x$
-3	$-12x^3$	$+3x$	-3

$= 8x^4 - 12x^3 - 2x^2 + 5x - 3$

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

4. Select all solutions to the equation $(x + 1)(3x - 2) = 0$. (−1 and 2/3)

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

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

5. Write down the solutions to the equation $x(x - 3)(2x + 8)(x + 3) = 0$.

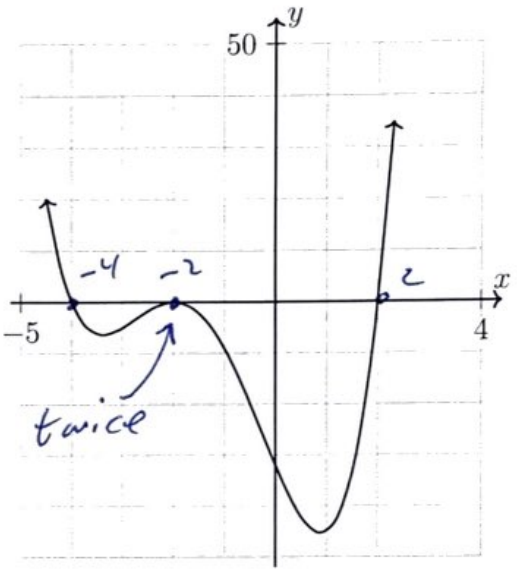
$0, 3, -4, -3$

6. Write down a polynomial in factored form having roots of $x = -3, 4, 10$.

$(x+3)(x-4)(x-10)$

A2-F.IF.7c Graph polynomials, identify zeros, end behavior

7. Below is a graph of the polynomial $f(x)$.



What is the degree of the function?

4

Which of the following could be its equation?

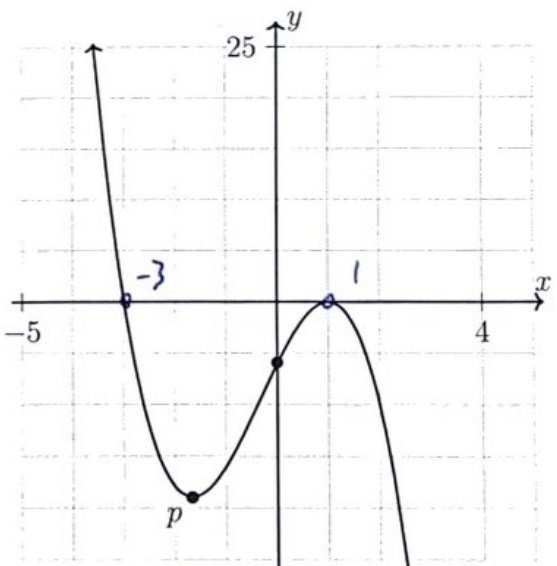
(a) $f(x) = (x+2)(x-4)(x-2)^2$

(b) $f(x) = (x-2)(x-4)(x+2)^2$

(c) $f(x) = (x+2)(x+4)(x-2)^2$

(d) $f(x) = (x-2)(x+4)(x+2)^2$

8. Given the polynomial $g(x) = -2x^3 - 2x^2 + 10x - 6$, graphed below.



(a) What is the leading coefficient?

-2

(b) Write down the constant term.

-6

(c) What are roots of the function?

$-3, 1$

(d) What factor has a multiplicity of 2?

$(x-1)$

(e) Write down the y-intercept as an ordered pair.

$(0, -6)$

(f) What term do we use to describe the point p on the plot?

Local Minimum or relative minimum

(g) What is the end behavior?

$x \to +\infty$ $\quad y \to -\infty$

$x \to -\infty$ $\quad y \to +\infty$

As x grows without bound positively, y grows without bound negatively.

As x grows without bound negatively, y grows without bound positively