Practice 6-1 Key

Polynomial Functions

Write each polynomial in standard form. Then classify it by degree and by number of terms.

1. $a^3(a^2 + a + 1)$

5th degree
Trinomial $a^5 + a^4 + a^3$

2. $-3 + 3x - 3x$

-3 Constant Monomial

3. $6x^4 - 1 - 5x + 3x^2$

$6x^4 + 3x^2 - 5x - 1$
Quartic (4th degree) polynomial

9. $6x - 7x$

$-1x$
Linear Monomial

10. $(3c^2)^2$

$9c^4$ (4th degree) Quartic Monomial

Practice 6-2

Polynomials and Linear Factors

For each function, determine the zeros. State the multiplicity of any multiple zeros.

1. $y = x(x - 8)^2$

$x = 0$
$x = 8 \rightarrow$ (multi 2)

2. $y = (x - 2)(x + 7)^3$

$x = 2$
$x = -7 \rightarrow$ Multi 3

3. $f(x) = x^4 - 8x^3 + 16x^2$

$x^2(x^2 - 8x + 16)$
$x^2(x - 4)(x - 4)$
$x = 0 \rightarrow$ multi 2
$x = 4 \rightarrow$ multi 2

Write the function in standard form.

4. $y = (x - 5)(x + 5)(2x - 1)$

$(x^2 - 25)(2x - 1)$
$2x^3 - x^2 - 50x + 1$

$(x^2 - 25)(2x - 1)$
$y = 2x^3 - x^2 - 50x + 25$

Write a polynomial function in standard form with the given zeros.

5. $-1, 3, 4$

$y = (x + 1)(x - 3)(x - 4)$
$(x^2 - 2x - 3)(x - 4)$
$x^3 - 4x^2$
$-2x^2 + 8x$
$-3x + 12$

$y = x^3 - 6x^2 + 5x + 12$

6. $-3, 0, 0, 5$

$y = x^2(x + 3)(x - 5)$
$y = x^2(x^2 - 2x - 15)$
$y = x^4 - 2x^3 - 15x^2$

Write each function in factored form.

7. $2x^3 + 10x^2 + 12x$

$2x(x^2+5x+6)$

$y = 2x(x+2)(x+3)$

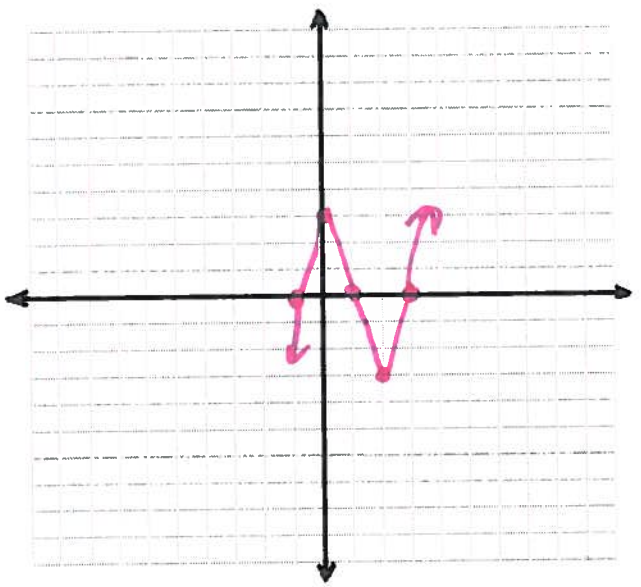
8. $x^4 - x^3 - 6x^2$

$x^2(x^2-x-6)$

$y = x^2(x-3)(x+2)$

Find the zeros of the function. Then graph the function.

9. $y = (x+1)(x-1)(x-3)$



$x = -1$

$x = 1$ $(-1)(-3)(-5$

$x = 3$

$(1)(-1)(-3)$

$(3)(1)(-1)$

$(5)(3)(1)$

x	y
-2	-15
-1	0
0	3
1	0
2	-3
3	0
4	15

Find the relative maximum, relative minimum, and zeros of the function.

10. $f(x) = x^3 - 7x^2 + 10x$

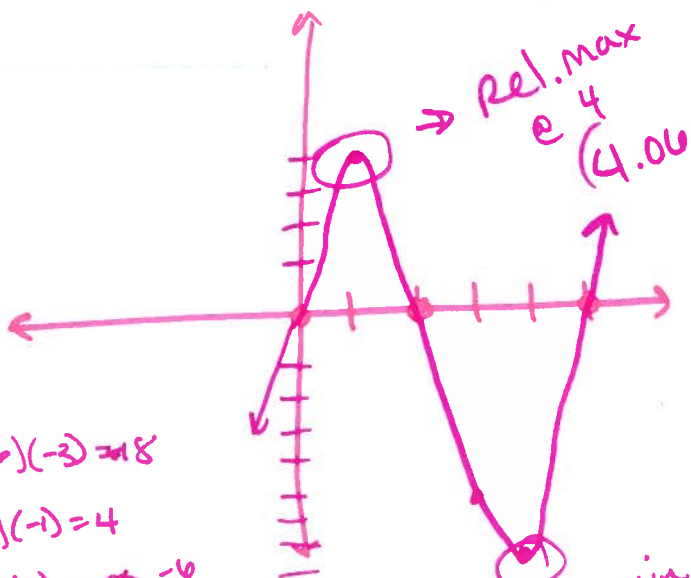
$f(x) = x(x^2-7x+10)$

$f(x) = x(x-5)(x-2)$

$x = 0$

$x = 5$

$x = 2$



x	y
-1	$-(-6)(-3) = 18$
0	0
1	$(-4)(-1) = 4$
2	0
3	$(-2)(1) = -6$
4	$4(-1)(2) = -8$
5	0
	$(1)(4) = 24$