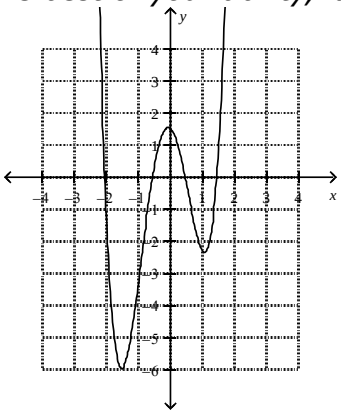
Unit 2 - Polynomials and Polynomial Functions 90% of Test

Unit 1– 10% of Test

To the best of your ability, identify the degree and describe the roots.

1.



Degree:_____

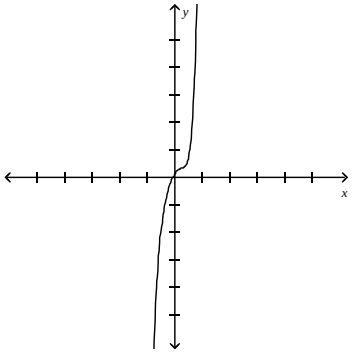
Total # of roots:_____

# of real roots:_____

# of imaginary roots:_____

Factors:_____

2.



Degree:_____

Total # of roots:_____

# of real roots:_____

# of imaginary roots:_____

Factors:_____

Polynomial Operations – Long Division and Remainder Theorem

3. Use polynomial long division to simplify each of the following ratios. There should be a zero remainder.

(a) $\dfrac{x^2+5x-24}{x-3}$

(b) $\dfrac{6x^2+11x-10}{3x-2}$

4. Use polynomial long division to write each of the following ratios in $q(x)+\frac{r}{x-a}$ form, where $q(x)$ is a polynomial and *r* is the remainder.

(c) $\frac{x^2-6x+11}{x-4}$

(d) $\frac{x^2+2x-25}{x+7}$

5. Is (x + 4) a factor of $x^4 - 6x^3 + 3x^2 + 26x - 24$? How do you know?

6. Which of the following linear expressions is a factor of the cubic polynomial $x^3+9x^2+16x-12$?

(1) $x+6$

(3) $x-3$

(2) $x-1$

(4) $x+2$

Polynomials and Linear Factors

Write each expression as a polynomial in standard form.

7. $x(x-4)^2$

8. $(x + 3)(x - 6)(x + 2)$

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

9. x = -2, 0, 4

10. x = -4, 1, 1

End Behavior of Polynomials

Find the right-hand and left-hand behavior of the graph of the polynomial function.

11. $f(x) = -x^4 + 6x^2 + 4$

12. $f(x) = -x^3 + 3x^2 - 5$

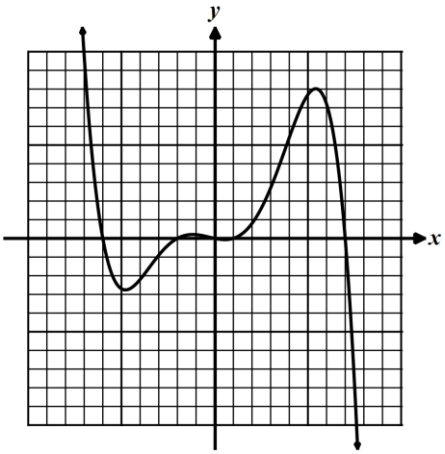
Sketch the general shape of each function.

13. $f(x) = (x - 3)(x + 4)(x - 6)^2$

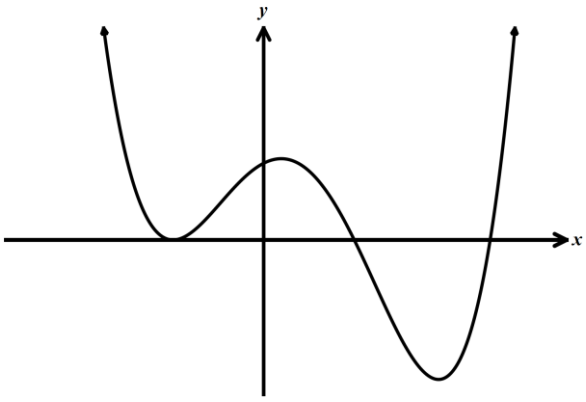
14. $f(x) = (x - 2)(x+4)(x - 3)$

Polynomial Equations

15 Given the following graph, state the factors and explain your reasoning:

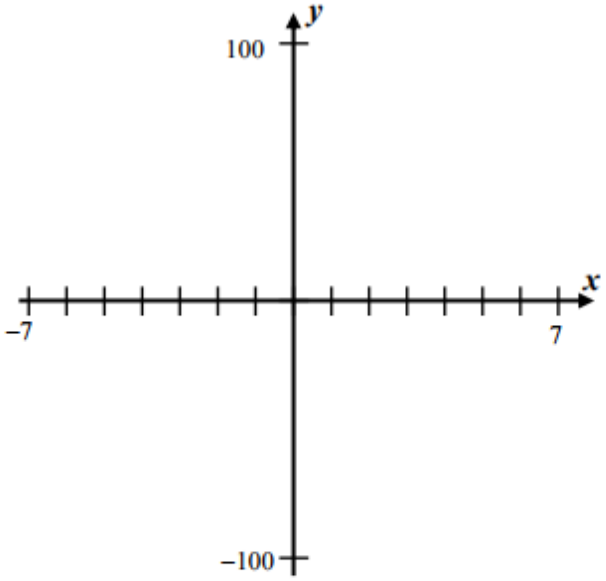


16 Given the following graph, explain what you know about the end behavior and degree:



17.

Create the equation of the cubic, in standard form, that has x-intercepts of $-4, 2,$ and 5 and passes through the point $(6, 20)$. Verify your answer by sketching the cubic's graph on the axes below.



18.

Create an equation for a cubic function, in standard form, that has x-intercepts given by the set $\{-3, 1, 7\}$ and which passes through the point $(-2, 54)$. Sketch your result on the axes shown below.