

## Polynomials

### Review for Test

Find all solutions for each equation or inequality (both real and imaginary). Check your solution(s). Remember, one or more potential solutions might not work. No decimal Answers.

1.  $2x^2 + 2x + 25 = 0$

2.  $\frac{1}{x} + \frac{5}{x} < 12$  

3.  $x^4 + 8x^2 - 9 = 0$

4.  $\frac{12}{3x-3} + \frac{1}{3} = \frac{4}{x-1}$

5.  $\sqrt{7x+3} - 4 > 7$

6.  $\sqrt{5x-1} < 8$

7.  $\sqrt[4]{8v+9} + 4 = 7$

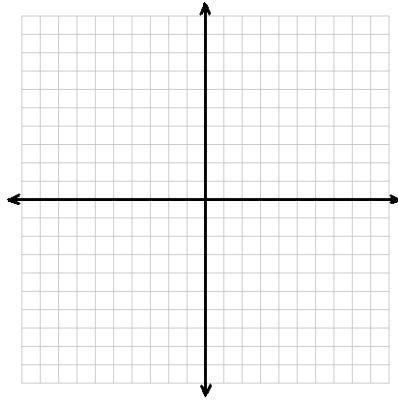
8.  $x^4 - 3x^3 + 19x^2 + 53x - 174 = 0$

Use your graphing calculator to find the real zeros and critical points of each function. Then graph the function.

9.  $y = x^4 - 4x^2$

Extrema:

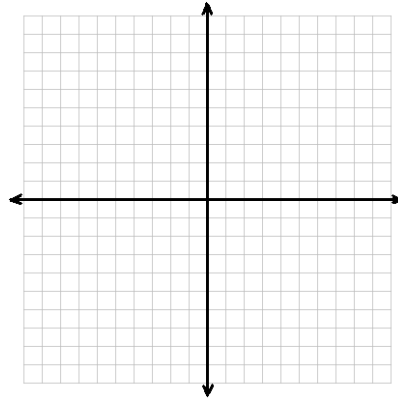
Zeros:



10.  $y = x^3 + 3x^2 - 4x - 2$

Extrema:

Zeros:



11. Write the polynomial equation of least degree having the roots  $4i$ ,  $2$ ,  $1$

12. Divide  $2x^3 - 8x^2 + 7x - 3$  by  $(x - 3)$  using long division.

13. Determine if  $(x + 3)$  is a factor of  $x^3 + x^2 - 10$ . Show your work.

**Simplify**

14.  $i^{37}(i^{103} + 4i^{150})$

15.  $\frac{6+3i}{4-2i}$

16. If  $f(x) = x + 8$  and  $g(x) = x^2 + 3$

a. Find  $(g \circ f)(x) =$

b. Find  $(f \circ g)(x)$

17. Find the inverse of the function:

a.  $y = 8x - 9$ .

b.  $y = \frac{7}{x-8}$

18. Determine if the function is odd, even or neither.

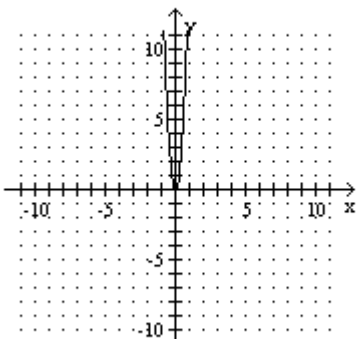
$$y = 3x^3 - 2x + 5$$

$$y = 2x^5 + 4x^3 - 6x$$

$$y = 2x^4 - 7x^2 - 10$$

19. Determine the symmetry.

20. State the parent function of



$$y = (x - 3)^2 - 9$$

$$y = \frac{1}{x - 4} - 12$$

