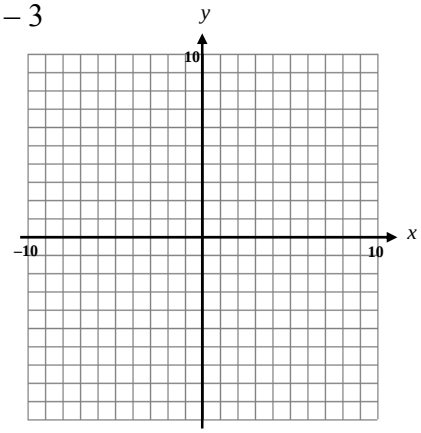
Precalculus
Chapter 2 Review Name _____

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



1. Vertex: _____

Axis: _____

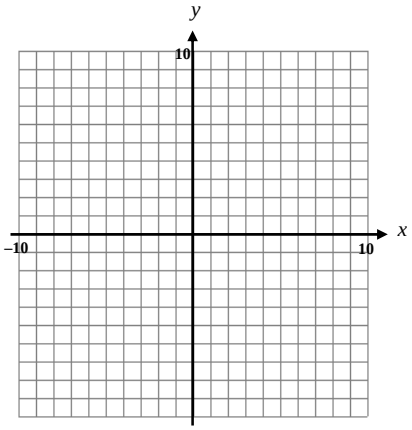
Description: _____

_____

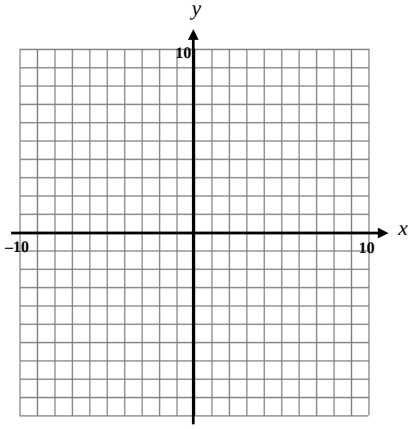
For #2 & 3, determine (if it exists):

a. vertical asymptotes
b. horizontal asymptotes
c. x-intercept(s)
d. y-intercept
e. holes
f. sketch the graph, without the calculator
identify at least 3 plotted points per region

2. $y = \dfrac{2x+3}{x-1}$



3. $y = \dfrac{x^2-2x-8}{x-4}$



4. Solve using the quadratic formula. $x^2 - 6x + 13 = 0$

Algebraically solve the inequality.

5. $(x-4)(x+3)^2 < 0$

6. $\dfrac{3x+2}{(x+1)(2x)} \le 0$

7. $\dfrac{1}{x+2} - \dfrac{2}{x-1} > 0$

Graphing calculator

8. Given: $g(x) = x^4 - 2x^3 + 13x^2 - 32x - 48$.
   (a) Use graphing, synthetic division and the quadratic formula to find all zeros.

   (b) Write the factorization of g(x) as a product of linear factors and irreducible quadratic factor.

9. Write an equation for the quadratic function with a vertex of (–3, 4) and containing point (–5, –8)

10. Divide. Is the divisor a factor of the polynomial? (yes/no)

$$\frac{4x^3 - 8x^2 + 3x - 1}{2x + 1}$$

11. Find a polynomial of degree 3 with roots –4, and $5 - i$. Express the answer in standard form.

12. Perform the indicated operation.

(a) $(3 - 4i) - (-8 + 2i)$ (b) $\frac{3 + i}{2 - 3i}$ (express the answer in $a + bi$ form)

13. The force of gravity F acting on an object is inversely proportional to the square of the distance d from the object to the center of the earth. If the force of gravity is 25.4 ft/s when an object is 25 miles from the center of the earth, find (a) a power equation to model this situation (b) k, the constant of variation and (c) the force when an object is 100 miles from the center of the earth.

14. Larry uses a slingshot to launch a rock straight up from a point 6 ft above level ground with an initial velocity of 170 ft/sec. Use the fact that $s(t) = -\frac{1}{2}gt^2 + v_o t + s_o$ (g = 32 ft/sec² or 9.8 m/sec²)

a. Find an equation that models the height of the rock t seconds after it is launched.

b. What is the maximum height of the rack? When will it reach that height? Determine the answer algebraically and graphically.

c. When will the rock hit the ground? Determine the answer algebraically and graphically.

Chapter 2 Review Key

1. V(1,–1); $x = 1$
   translated right 1 and down 1
   opens down, scale change of –2

2. (a) $x = 1$ (b) $y = 2$ (c) $x = -1.5$
   (d) $y = -3$ (e) none

3. x int: –2 y int: 2
   hole @ 4

4. $x = 3 \pm 2i$

5. $(-\infty, -3)$ & $(-3, 4)$

6. $(-\infty,-1) \cup [-2/3, 0)$

7. $(-\infty, -5) \cup (-2, 1)$

8. (a) $x = -1, 3, \pm 4i$
   (b) $g(x) = (x+1)(x-3)(x^2 + 16)$

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

10. $(2x+1)(2x^2 - 5x + 4) - 5 = 4x^3 - 8x^2 + 3x - 1$
    no the divisor is not a factor

11. $f(x) = x^3 - 6x^2 - 14x + 104$

12. a) $11 - 6i$ b) $\frac{3}{13} + \frac{11}{13}i$

13. $F = \frac{k}{d^2}$; $k = 15875$
    $F = 1.5875$ ft/s

14a) $s(t) = -16t^2 + 170t + 6$
   b) 457.56 ft @ 5.31 sec
   c) 10.7 seconds