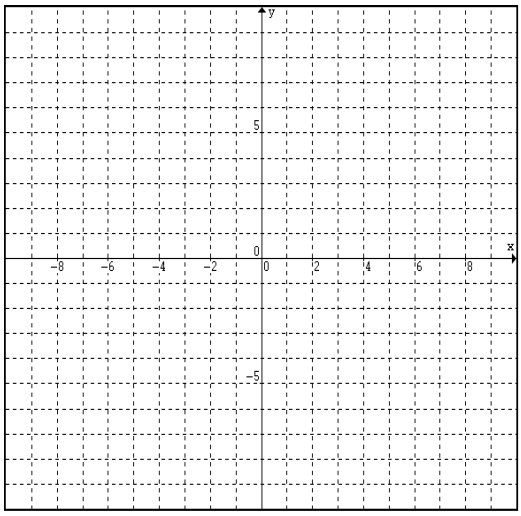
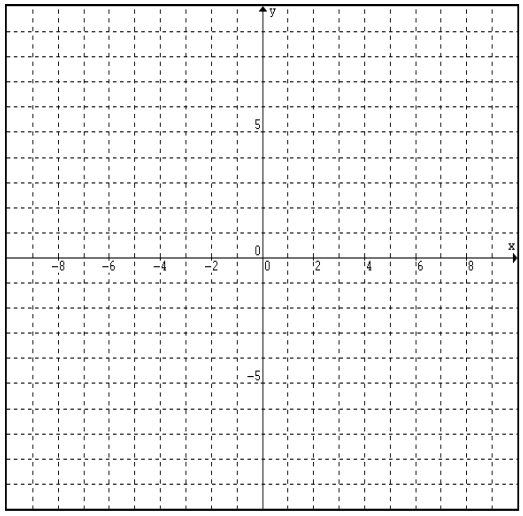
College Algebra NAME_____
Chapter 3 Review

a) Write the quadratic in vertex form. b) Describe the end behavior of the graph, c) Identify the vertex, d) write the axis of symmetry e) find the x- intercept(s), f) find the y-intercept, g) state whether it has a Maximum or a Minimum, and h) graph.

1. $f(x) = x^2 - 6x - 16$

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

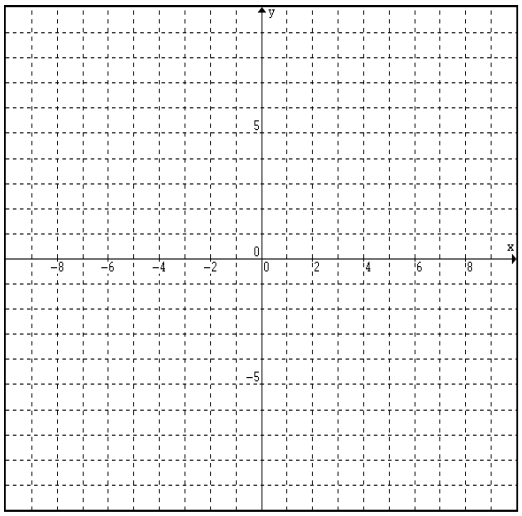


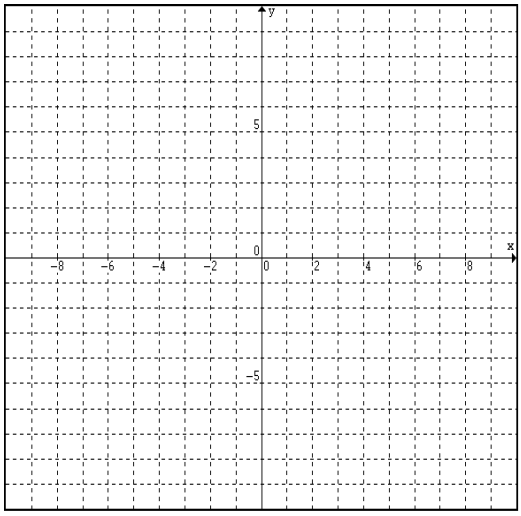


Find the vertex and graph.

3. $f(x) = -3x^2 - 18x - 29$

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

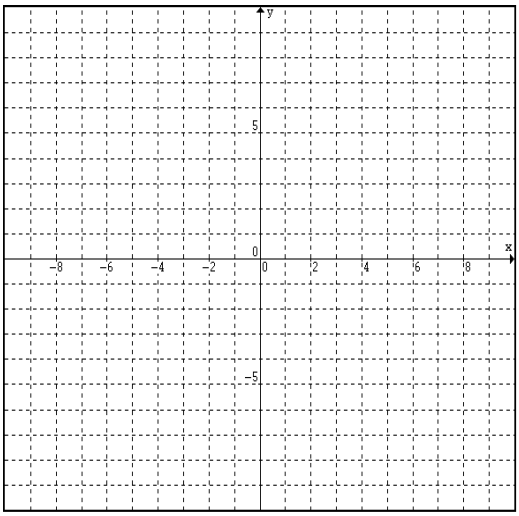


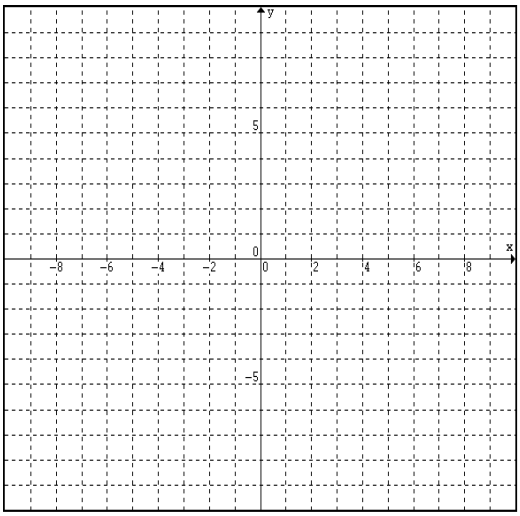


For the following polynomials, a) describe the end behavior, b) find the x-intercepts, c) find the y-intercept, d) make a T-chart of appropriate points, e) sketch the function.

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

6. $f(x) = x^3 - 4x^2 - 12x$





Divide using long division

7. $\frac{2x^3+3x-1}{x+2}$

Divide using synthetic division

8. $\frac{x^3-5x+12}{x-3}$

Factor the polynomial and state the zeros.

10. $P(x) = x^3 - 8x^2 + 17x - 10$
$x - 5$ *is a factor.*

11. $P(x) = x^4 - 8x^3 + 9x^2 + 38x - 40$
two zeros are 5 and – 2.

Factor and find the zeros.

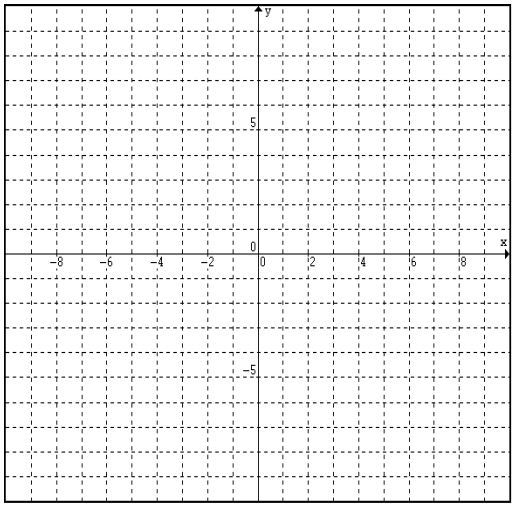
12. $M(x) = x^3 + x^2 - 4x - 4$

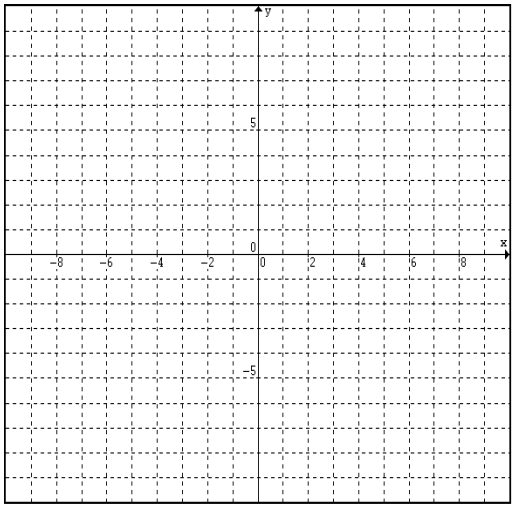
13. $P(x) = x^3 - 2x^2 - 36x + 72$

For the following polynomials, a) describe the end behavior, b) find the x-intercepts, c) find the y-intercept, d) make a T-chart of necessary points, e) sketch the function.

14.. $f(x) = x^4 + x^3 - 11x^2 + x - 12$

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





Find the factors and zeros of the following functions.

16. $f(x) = x^3 - 10x^2 + 17x - 8$

17. $f(x) = x^4 + x^3 - 11x^2 + x - 12$

Write the function given the zeros.

18. x = 2, 0, – 3

19. $x = -5, \pm\sqrt{3}$

20. $x = 0, -2, \pm 2i$

Write the standard form of the quadratic function whose graph is a parabola with the given vertex and passes through the given point.

21. Vertex: (1, – 2); point: (2, – 4)

22. Vertex: (– 3, 5): point (4, 2)

23. The profit P (in hundreds of dollars) that a company makes depends on the amount x (in hundreds of dollars) the company spends on advertising according to the model $P = 230 + 20x - .5x^2$?. What is the maximum profit and what expenditure for advertising yields the maximum profit?

24. The path of a ball is modeled by the function $f(x) = -\frac{1}{20}x^2 + 3x + 5$, where $f(x)$ is the height (in feet) of the ball and x is the horizontal distance (in feet) from where the ball was thrown.

a. What is the maximum height of the ball?

b. Which number determines the height at which the ball was thrown? Does changing this value change the coordinates of the maximum height of the ball? Explain.

25. A bulk food storage bin with dimensions 2 feet by 3 feet by 4 feet needs to be increased in size to hold five times as much food as the current bin.

a. Assume each dimension is increased by the same amount. Write a function that represents the volume V of the new bin.

b. Find the dimensions of the new bin.