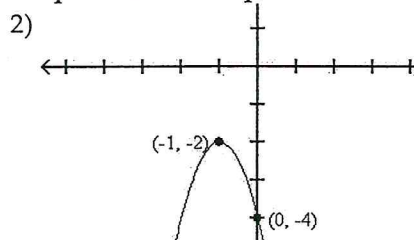# Trig/Precalc Chapter 2 Final Review

Write an equation for the **linear** function f satisfying the given conditions.

1) $f(-3) = 8$ and $f(1) = 4$

Write an equation for the quadratic function whose graph contains the given vertex and point.

2)

(-1, -2)

(0, -4)

(Write your answer in vertex form.)

Solve the problem **algebraically or graphically. If graphically, show sketch and window.**

3) The number of mosquitoes M(x), in millions, in a certain area depends on the June rainfall x, in inches: $M(x) = 9x - x^2$. What rainfall produces the maximum number of mosquitoes?

Write the statement as a power function equation. Use k as the constant of variation.

4) The height h of a cone with a fixed volume varies inversely as the square of its radius r.

Determine whether the power function is even, odd, or neither.

5) $f(x) = \frac{2}{3}x^{3/2}$

6) $f(x) = -9x^{2/7}$

Solve the problem. **Use our multi-step process from our notes.**

7) The weight of a liquid varies directly as its volume V. If the weight of the liquid in a cubical container 5 cm on a side is 375 g, find the weight of the liquid in a cubical container 4 cm on a side.

Describe the end behavior of the polynomial function by finding $\lim\limits_{x \to \infty} f(x)$ and $\lim\limits_{x \to -\infty} f(x)$

8) $f(x) = -x^3 - 7x^2 - 5x - 7$

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

Find a cubic function with the given zeros. **Write eqn in standard form.**

10) $\sqrt{2}, -\sqrt{2}, 4$

Solve the problem graphically. **Show sketch and window.**

11) A rectangular piece of cardboard measuring 25 inches by 44 inches is to be made into a box with an open top by cutting equal size squares from each corner and folding up the sides. Let x represent the length of a side of each such square. What is the maximum volume of this box? If necessary, round to 2 decimal places.

Use the Factor Theorem to determine whether the first polynomial is a factor of the second polynomial.

12) $x + 2$; $6x^3 + 9x^2 - 5x + 2$

13) $x + 5$; $6x^3 + 28x^2 - 11x + 5$

Use the Rational Zeros Theorem to write a list of all potential rational zeros

14) $f(x) = 14x^3 + 56x^2 + 2x - 7$

Use synthetic division to determine whether the number k is an upper or lower bound (as specified) for the real zeros of the function f.

15) $k = 4$; $f(x) = 2x^3 - 2x^2 - 5x + 5$; Upper bound?

16) $k = 0$; $f(x) = x^3 + 5x^2 - 4x + 3$; Lower bound?

Write the polynomial in standard form and identify the zeros of the function.

17) $f(x) = (x - 1)(x - \sqrt{7}\,i)(x + \sqrt{7}\,i)$

State how many complex and real zeros the function has.

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

Write a linear factorization of the function.

19) $f(x) = x^4 + 8x^3 + 19x^2 + 32x + 60$