

Review for Exam 2 SPRING 2009

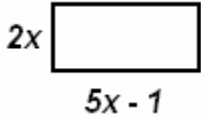
Chapter 2 Review Exercises P.162-167
#14-17,23,80,85,88,90,94

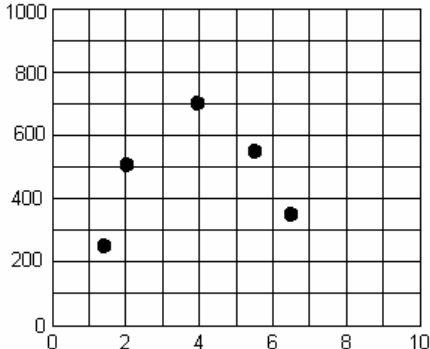
Chapter 3 Review Exercises P.237-240
#1,5,7,9,25,31,35,68-71,75,78

Chapter 4 Review Exercises P.352-358
#1-3,5,6,8,11-12,19-26, 35,38,40,43,
101-103, 105,106,109,113,121,123

Chapter 6 Review Exercises P.574-579
#5, 9-12; also P.486-488 #23,24,31,33,85(a),86(a)

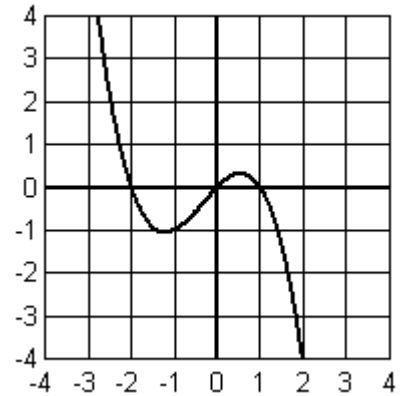
We also discussed basic ideas about quadratic and power function regression.

- Determine the equation of the line that goes through points (2, -3) and (-4, 7).
- Find the equation of the line through (5,2) that is perpendicular to line $y - 2 = 4x + 1$.
- Find the length of the longest side of the rectangle in the figure, given that its perimeter is 26ft. 
- Find the vertex (h,k) of the parabola $f(x) = -1/2 x^2 - 5x + 2$.
- On Mars the acceleration of gravity is $g = 13\text{ft/sec}^2$. Write an equation for the trajectory of a ball thrown straight up at 88ft/sec from a height of 6ft.
- Find all the solutions of $2x^2 - 8x - 7 = 0$.
- How many x-intercepts does the graph of $9x^2 - 12.6x + 4.41 = 0$ have & find the value(s).
- Solve the linear systems showing all steps.

$$\begin{array}{rcl} 5x - 2y = -16 & 2x - 3y = -2 & 4x - 8y = 3 \\ x + 4y = -1 & -8x + 12y = 8 & -x + 2y = 0 \end{array}$$
- The path of an object is given by $s(t) = -8t^2 + 512t + 50$ where t is in seconds and s is measured in feet. Find the maximum height of the object. How high was the object at its initial position?
- Using the points in the figure develop the equation for an approximate quadratic model. → 
- In the early 1960s data was collected on expenditures per pupil for high schools with a range of student enrollments from 150 to 2400. The quadratic regression of the data produced the quadratic model for cost C and number of pupils x given by $C(x) = 0.12x^2 - 12x + 700$. Determine the minimum cost per pupil.
- The car manual for a certain custom car suggests using 89 octane gasoline. As an experiment the owner decides to use some 87 octane and 93 octane in combination with the 89 octane currently in the tank in order to approximate 89 octane. There is 1 gallon of 89 octane in the 16 gallon tank. How many gallons of 87 and 93 octane should be used to fill up the tank to achieve a mixture of 89 octane?
- A box with volume 270 cubic inches is being constructed by cutting 2-inch squares from the corners of a rectangular sheet of metal that is 6 inches longer than it is wide. Let x be the width of metal sheet. Construct a polynomial equation in x for the volume of the box.

14. Use the graph of the polynomial function to answer the following.

- (i) Determine the number of turning points. Answer _____
 (ii) Is the leading coefficient positive or negative?
 Circle your choice: POSITIVE NEGATIVE
 (iii) Determine the minimum degree. Answer _____
 (iv) Use the name C for the leading coefficient, then give a complete factored form for the equation of the polynomial.



Answer: _____

15. The leading term of polynomial $f(x)$ is $-7x^5$. Answer the following.

- (a) How many possible turning points are there? _____
 (b) Describe the behavior of the graph on the left end; that is, as x goes to $-\infty$. _____
 (c) If there was a zero of multiplicity 3 at $x = 5$, make a possible sketch of the curve over the interval $[4, 6]$.

16. A polynomial has zeros at $x = -4, -1, 0$, and 6 . The zero at 6 has multiplicity 2 while the others have multiplicity 1. Assume the leading coefficient is named K , then write an expression for the polynomial in factored form. _____

17. Sketch the graph of the function $f(x) = \begin{cases} \frac{1}{2}x^2 - 2, & \text{on } [-4, 0] \\ 2x - 2, & \text{on } (0, 2) \\ 4, & \text{on } [2, 4] \end{cases}$.

18. Polynomial $f(x)$ has zeros at $x = -5, -1$, and 3 . The zero at 3 has multiplicity 2 and the others have multiplicity 1. In addition the leading coefficient is positive. Sketch a possible continuous graph of the polynomial where its degree is as small as possible.

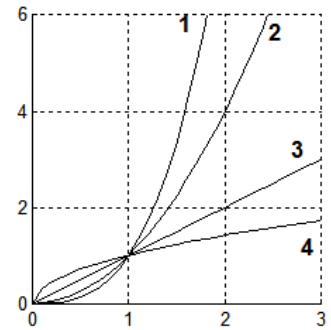
19. Simplify the following so that any exponents in the answer are positive rational values.

(a) $(\sqrt[4]{y})^{-3}$ (b) $\sqrt{y}\sqrt[4]{y}$ (c) $\frac{\sqrt{y}}{\sqrt[3]{y}}$

20. Solve each of the following equations. (a) $\sqrt{1-x} = x + 5$ (b) $\sqrt[3]{2x^2 + 1} = \sqrt[3]{1-x}$

21. The wingspan L in feet of a bird weighing W pounds is given by $L = 2.43W^{0.3326}$. Estimate the wingspan of a bird that weighs 5.2 pounds.

22. In the figure determine which of the numbered graphs has the following equations. $y = x$, $y = \sqrt{x}$, $y = x^2$, $y = x^3$



23. Give a polynomial equation that is an even function; an odd function. TRUE/FALSE;

___ 1. A line with negative slope will be perpendicular to all lines with positive slope.

___ 2. Quantity s is directly proportional to t provided we can find a constant k so that $s = kt$.

___ 3. The parabolic graph of $f(x) = -3(x-1)^2 + 4$ changes from increasing to decreasing at $(1, 4)$.

___ 4. Quadratics are nonlinear functions.

___ 5. A quadratic equation always has two x -intercepts.

___ 6. A quadratic modeling projectile motion has leading coefficient less than 0.

___ 7. If a system is consistent and the equations are independent, then the system has a unique solution.

___ 8. Every power function is a polynomial.

___ 9. A cubic polynomial can have no local extrema.

___ 10. The domain of any polynomial is all real numbers.