## Algebra II Chapter 5: 5.1-5.4 Test Review

<u>Test</u> <u>Review is due on the day of the test.</u> <u>Answers should be written on separate paper with graphs on</u> <u>graph paper.</u> \* calculator allowed

Evaluate the expression for the given value of the variable(s).

1. 
$$|4b - 4| + |3 - b^2| + 2b^3$$
;  $b = 2$  2.  $-x^2 - 4x - 4$ ;  $x = -3$ 

Find the value of *y* for a given value of *x*, if *y* varies directly with *x*.

3. If y = 166 when x = 83, what is y when x = 23?

4. What is the vertex of the function y = |-3x + 2| - 4?

## Solve the system both the method of substitution and elimination.

5. 
$$\begin{cases} -3x - 3y + 2z = -7 \\ z = 1 \\ -2x - 3y + z = -6 \end{cases}$$
6. 
$$\begin{cases} -4x + 4y = -8 \\ x - 4y = -7 \end{cases}$$

Determine whether the function is linear or quadratic. Identify the quadratic, linear, and constant terms.

7. 
$$y = (x + 1)(6x - 6) - 6x^2$$
  
8.  $f(x) = (3x + 2)(-6x - 3)$ 

Find a quadratic model for the set of values.

\*9. (-2, 8), (0, -4), (4, 68)

\*10. (-2, 15), (0, -3), (4, 33)

Identify the vertex and the axis of symmetry of the parabola. Identify points corresponding to *P* and *Q*.



13. Find the vertex of  $y = -3x^2 - 24x - 52$ , then write in vertex form.

14. Find the vertex of  $y = 2x^2 + 16x + 35$  then write in vertex form.

\*15. Ralph's Jeans Outlet determines that the number of jeans it can sell each week is given by the formula  $D = -3p^2 + 180p - 285$ , where p is the price of the jeans in dollars.

**a.** At what price will Ralph's sell the maximum number of jeans?

**b.** What is the maximum number of jeans that can be sold?



16. Use vertex form to write the equation of the parabola

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\*26. The table shows the number of copies of a book sold per 100,000 people in the United States for five selected years. The values in the first column are years since 1987, so x = 0 corresponds to 1987, x = 3 corresponds to 1990, and so on.

Years since 1987 (x)	Copies sold per 100,000 people (y)
0	8.3
3	9.4
6	9.5
9	7.4
12	5.7

- **a.** Use a graphing calculator to model the data with a quadratic function. Round the coefficients and constant term to four decimal places.
- **b.** Graph the data and the quadratic function.

## Using graph paper, graph the following equations. Identify the vertex, axis of symmetry, and the minimum or maximum value of the function.

27.	$y = x^2 + 3x + 2.$	28.	$y = 3x^2 - 12x + 13.$
29.	$y = -3x^2 + 6x + 5.$	30.	$y = (x - 7)^2 + 5.$

- 31. Use the equation of  $y = (x 3)^2 + 5$  write the new equation of the parabola if....
  - **a.** you translate the parabola to the right 2 units and down 7 units, what is the equation of the new parabola in vertex form?
  - **b.** you translate the parabola to the left 2 units and up 7 units, what is the equation of the new parabola in vertex form?

- \*32. The distance *d* in meters traveled by a skateboard on a ramp is related to the time traveled *t* in seconds. This is modeled by the function:  $d(t) = 4.9t^2 2.3t + 5$ . What is the maximum distance the skateboard can travel, and at what time would it achieve this distance? Round your answers to the nearest hundredth.
- \*33. The table shows approximate fuel consumption in miles per gallon, given the tread height of the tire in mm. Find a quadratic model for the fuel consumption given the tread height. Use the model to estimate the fuel consumption for a car with a tread height of 15 mm.

Fuel Consumption (miles per gallon)	Tread Height (mm)		
37.48	2		
40	5		
40.28	12		
31	20		
14.48	27		
5	30		

\*34. A biologist took a count of the number of migrating waterfowl at a particular lake, and recounted the lake's population of waterfowl on each of the next six weeks.

Week	0	1	2	3	4	5	6
Population	585	582	629	726	873	1,070	1,317

- **a.** Find a quadratic function that models the data as a function of *x*, the number of weeks.
- **b.** Use the model to estimate the number of waterfowl at the lake on week 8.
- \*35. Graph of  $y = -2(x 2)^2 4$ ? Identify the vertex and the y-intercept.

Find the value of *c* for the quadratic equation having the given point:

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36. 
$$y = 2x^2 + c$$
, (-1,5)   
  $y = x^2 + c$ , (4,10)

## Algebra II Chapter 5: 5.1-5.4 Test Review Answer Section

**4.**  $\binom{2}{3}$ , -4) **5.** (2, 1, 1) **3**. 46 21 **2**. –1 **6**.(5, 3) 1. 7 .linear function; l inear term:  $0x_1$  constant term: -6**8**.q uadratic function; quadratic term:  $-18x^2$ ; linear term: -21x; constant term: -6**9.**  $y = 4x^2 + 2x - 4$  **10.**  $y = 3x^2 - 3x - 3$  **11.** (-1, -2), x = -1; P'(0, -1), Q'(-3, 2)**12.** (-3, 1), x = -3; P'(-2, 0), Q'(-5, -3) **13.**  $y = -3(x + 4)^2 - 4$  **14.**  $y = 2(x + 4)^2 + 3$ **15.** \$30; 2,415 jeans **16.**  $y = -2(x + 3)^2 + 3$  **17.**  $y = 3(x - 2)^2 - 4$  **18.** -3x(5x + 7)**19.**  $-4(-2x^2 - 3x + 4)$  **20.** (x - 2)(x - 4) **21.** (x - 9)(x + 7) **22.** (3x + 5)(x + 7)23. (5x + 3)(x - 5)**24.**  $(4x + 5)^2$  **25.** (3x + 4)(3x - 4)**26.a.**  $y = -0.0619x^2 + 0.5029x + 8.3857$ b. 12





31.

**32**. 4.73 meters at 0.23 seconds The maximum distance is about 4.73 meters at 0.23 seconds. **33.**  $F = -0.08t^2 + 1.4t + 35$ ; 38 miles per gallon 34.  $P(x) = 25x^2 - 28x + 585$ ; 1,961 waterfowl

35.



Vertex: (2, -4); b = -12

