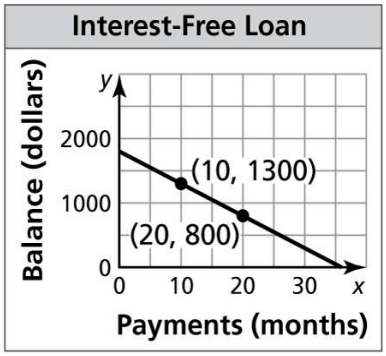
Algebra 2 1st Semester Final Exam Review '15 – '16 **Multiple Choice**

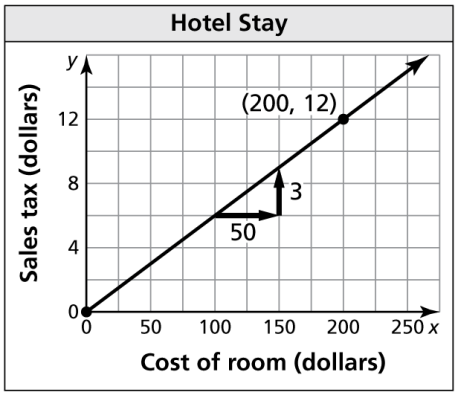
1. Write an equation that models the data displayed in the "Interest-Free Loan" graph that is provided.



A) $y = -\frac{1}{5}x + 804$ B) $y = -50x + 1800$

C) $y = 50x - 200$ D) $y = 20x + 800$

2. Write an equation that models the data displayed in the "Interest-Free Loan" graph that is provided.



A) $y = \frac{3}{50}x + 12$ B) $y = \frac{3}{50}x$

C $y = -\frac{3}{50}x + 12$ D) $y = -\frac{3}{50}x$

3. Solve the following system:
$$-x - y - 2z = 9$$
$$-2x - 2y - z = 1$$
$$-x - y + z = -10$$

A) (-1, -1, -2) B) No solution C) Infinite solutions D) (1, 1, 2)

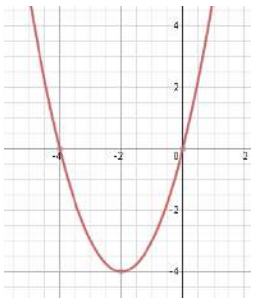
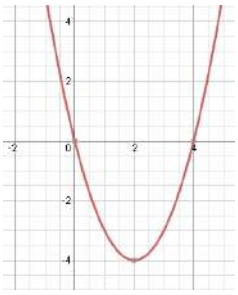
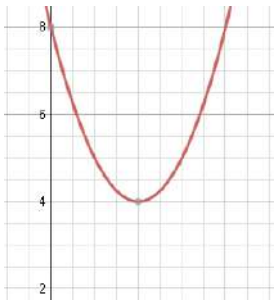
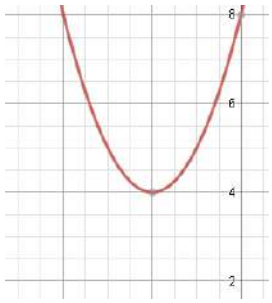
4. Solve the following system:
$$x - 6y + 2z = 5$$
$$2x - 3y + z = 4$$
$$3x + 4y - z = -2$$

A) (6, 5, -3) B) No solution C) Infinite solutions D) (1, -3, -7)

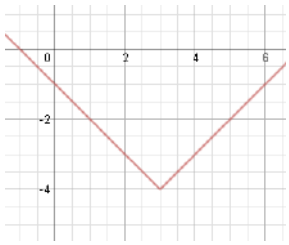
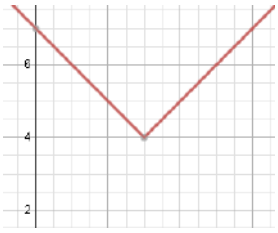
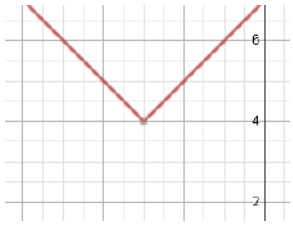
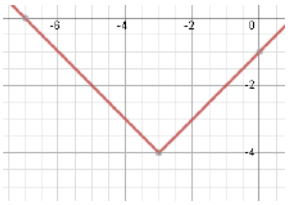
5. A Major League Baseball stadium sells three types of tickets. Reserved tickets are sold for $20 each, field-level tickets are sold for $50 each, and box seat tickets are sold for $100 each. A graph depicts these three types of tickets sold for their Friday night game. What does the point of intersection represent?

A) When all three ticket prices generate the same revenue.
B) When all three types of tickets have sold the same amount.
C) When all three types of tickets cost the same amount.
D) When all three types of tickets reach their maximum revenue

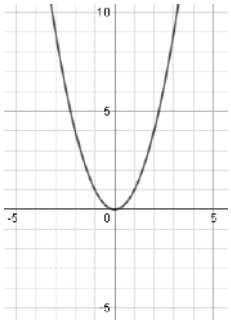
6. Which is the graph of $y = (x + 2)^2 + 4$?

A)  B)  C)  D) 

7. Select the graph of: f(x) = $|x-3|-4$

A)  B)  C)  D) 

8. The graph of $y = x^2$ is shown in the standard (x, y) coordinate plane below. For which of the following equations is the graph of the parabola shifted 3 units to the right and 2 units down?



A) $y = (x + 3)^2 - 2$

B) $y = (x - 3)^2 - 2$

C) $y = (x + 3)^2 + 2$

D) $y = (x - 3)^2 + 2$

9. The height of a bridge is given by the equation $y = -3x^2 + 12x$, where y is the height of the bridge (in miles) and x is the number of miles from the base of the bridge.

I. How far from the base of the bridge does the maximum height occur?

II. What is the maximum height of the bridge?

A) I. 2 miles
II. 12 miles

B) I. -2 miles
II. 12 miles

C) I. 3 miles
II. 9 miles

D) I. 3 miles
II. 6 miles

10. The height of a bridge is given by the equation $y = -4x^2 + 24x$, where y is the height of the bridge (in miles) and x is the number of miles from the base of the bridge.

I. How far from the base of the bridge does the maximum height occur?

II. What is the maximum height of the bridge?

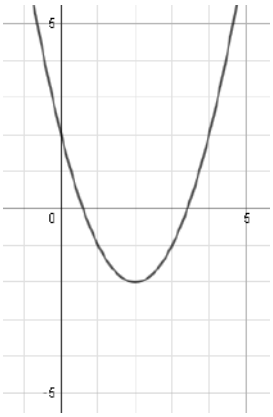
A) I. 3 miles
II. 36 miles

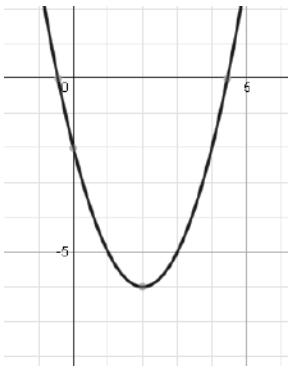
B) I. 3 miles
II. 108 miles

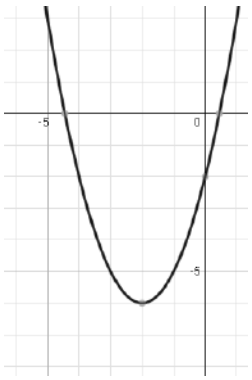
C) I. 4 miles
II. 32 miles

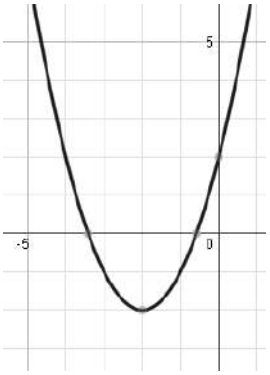
D) I. 4 miles
II. 160 miles

11. Graph $y = x^2 + 4x + 2$ (*hint use $x = \frac{-b}{2a}$)

A) 

B) 

C) 

D) 

12) Write an equation of the parabola in vertex form $y = a(x - h)^2 + k$ that passes through (0, -24) and has vertex (-6, -12).

A) $y = -\frac{1}{3}(x + 6)^2 - 12$

B) $y = -\frac{1}{3}(x - 6)^2 - 12$

C) $y = -3(x + 6)^2 - 12$

D) $y = -3(x - 6)^2 - 12$

13. Write an equation of the parabola in vertex form $y = a(x - h)^2 + k$ that passes through (-7, -15) and has vertex (-5, 9).

A) $y = -\frac{1}{6}(x + 5)^2 + 9$

B) $y = -\frac{1}{6}(x - 5)^2 + 9$

C) $y = -6(x + 5)^2 + 9$

D) $y = -6(x - 5)^2 + 9$

14. Write an equation of the parabola in intercept form $y = a(x - p)(x - q)$ that has x – intercepts of 9 and 1 and passes through (0, -18).

A) $y = -\frac{1}{2}(x - 9)(x - 1)$

B) $y = -\frac{1}{2}(x + 9)(x + 1)$

C) $y = -2(x - 9)(x - 1)$

D) $y = -2(x + 9)(x + 1)$

15. Write an equation of the parabola in intercept form $y = a(x - p)(x - q)$ that has x – intercepts of 12 and -6 and passes through (14, 4).

A) $y = \frac{1}{10}(x - 12)(x + 6)$

B) $y = \frac{1}{10}(x + 12)(x - 6)$

C) $y = 10(x - 12)(x + 6)$

D) $y = 10(x + 12)(x - 6)$

16. Find the focus and directrix of the parabola with the equation y = $-\frac{1}{20}x^2$

A) $F:(0,-5)$, $D:x=5$ B) $F:(-5,0)$, $D:x=-5$ C) $F:(0,5)$, $D:y=-5$ D) $F:(0,-5)$, $D:y=5$

17. Find the focus and vertex of the parabola with the equation y = $\frac{1}{24}(x+7)^2+3$

A) F: (-3, -4) V: (-7, -3) B) F: (3, 4) V: (7, 3) C) F: (-7, 9) V: (-7, 3) D) F: (7, -9) V: (3, -7)

18. Write an equation for the information given. Vertex (0, 0) Focus (0, -2)

Use: $y=\frac{1}{4p}(x-h)^2+k$

A) y = $-\frac{1}{8}x^2$ B) y = $\frac{1}{4}x^2$

C) y = $-\frac{1}{4}x^2$ D) y = $\frac{1}{8}x^2$

19. Multiply: (2 + 7i)(4 – 2i)

A) 6 + 5i B) 28 – 4i C) 22 + 24i D) 8 – 14i

20. Multiply: (-3 + 4i)·(2 + 7i)

A) -1 + 11i B) -34 C) -34 – 13i D) -5 + 11i

22. Factor: $x^2 – 2x – 8$

A) (x – 4)(x – 2) B) (x + 4)(x – 2) C) (x – 4)(x + 2) D) (x + 4)(x + 2)

23. Factor completely: $3x^3 – 3x^2 – 18x$

A) (x – 5)(3x + 4) B) (x + 4)(x – 15) C) x^4(x – 5)(3x + 4) D) x^4 (x + 4)(x – 15)

24. Factor completely: $3x^6 – 11x^5 – 20r^4$

A) 3x(x – 6)(x +1) B) 3x(x – 3)(x + 2) C) (x + 6)($3x^2$ – 6) D) x (x +2)(x – 3)

25. Factor completely: $4x^2 - 36$

A) (2x – 6)(2x + 6) B) (4x – 6)(4x + 6) C) 4(x – 6)(x + 6) D) 4(x – 3)(x + 3)

26) Factor: $9x^2 - 16$

A) (9x-4)(9x + 4) B) $(3x - 4)^2$ C) 9(x – 4)(x + 4) D) (3x – 4)(3x + 4)

27. Solve: $x^2 + 16x = 0$

A) 0, -16 B) 0, -4 C) 0, 4 D) 0, 16

28. Solve: $2x^2 + 6x = 0$

A) 0, 3 B) 0, -3 C) 2, 6 D) -2, -6

29. Solve: $3x^2 + x = 4$

A) $-\frac{4}{3}$, -1 B) $-\frac{4}{3}$, 1 C) $\frac{4}{3}$, -1 D) $\frac{4}{3}$, 1

30. Solve: $3x^2 - 5x = 2$

A) 6, -1 B) -6, 1 C) ⅓, -2 D) -⅓, 2

31. Solve using quadratic formula: $4x^2 - 5x + 10 = 0$

A) $\frac{-5 \pm 3i\sqrt{15}}{8}$ B) $\frac{5 \pm 3i\sqrt{15}}{8}$ C) $\frac{5 \pm \sqrt{185}}{8}$ D) $\frac{5 \pm i\sqrt{185}}{8}$

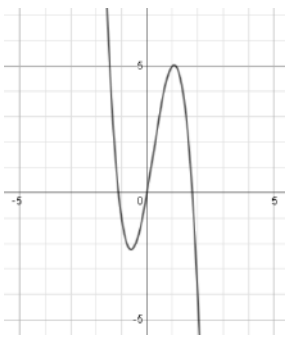
32. Solve: $x^2 + 2x - 6 = 0$

A) $-1 \pm \sqrt{7}$ B) $-1 \pm \sqrt{7}$ C) $-1 \pm i$ D) $1 \pm i$

33. Solve: $x^2 - 9 = -15$

A) $\pm 3i\sqrt{2}$ B) $\frac{9 \pm \sqrt{141}}{2}$ C) $\pm i\sqrt{6}$ D) $\frac{-9 \pm \sqrt{141}}{2}$

34. Describe the degree and leading coefficient of the graph of function f(x) below.



A) Odd degree, positive leading coefficient

B) Odd degree, negative leading coefficient

C) Even degree, positive leading coefficient

D) Even degree, negative leading coefficient

35. Simplify: $(-x^3 - 8x) - (-4x + 5 - 3x^3)$

a) $-4x^3 - 12x + 5$ b) $-4x^3 + 4x - 5$ c) $2x^3 - 4x - 5$ d) $3x^3 - 11x + 5$

36. Simplify: $(16x^3 - x^2 + 3) - (-12x^3 + 3x^2 + 2)$

A) $28x^3 - 4x^2 + 1$ B) $28x^6 - 4x^4 + 1$ C) $4x^3 + 2x^2 + 5$ D) $4x^6 + 2x^4 + 5$

37. Simplify: $(3x - 2)(4x^2 - 3x + 5)$

A) $4x^2 - 9x - 10$ B) $12x^3 - 17x^2 + 21x - 10$

C) $12x^3 + 1x^2 + 21x + 10$ D) $4x^2 + 3$

38. Divide: $(2x^4 - 3x^3 - 6x^2 - 8x - 3) \div (x - 3)$

a) $2x^3 + 3x^2 + 3x + 1$ b) $-2x^3 - 3x^2 - 3x - 1$

c) $2x^3 - 9x^2 + 21x - 71 + \frac{210}{x-3}$ d) $2x^2 + 3x + 3 + \frac{1}{x-3}$

39. Divide: $(2x^3 + x^2 - 8x + 5) \div (x + 3)$

A) $2x^2 + 7x + 13 + \frac{44}{x+3}$ B) $2x^2 - 5x + 7 - \frac{16}{x+3}$

C) $2x^3 + 7x^2 + 13x + \frac{44}{x+3}$ D) $2x^3 - 5x^2 + 7x - \frac{16}{x+3}$

40. Solve (where do the 2 graphs intersect)
$y = x + 5$ and $y = x^2 - x + 2$

A) (2, -1) B) (2, 7) (-1, 4) C) (-2, 3) (1, 6) D) (-2, 1)

41. Given one factor of $f(x) = x^3 + 3x^2 - 33x - 35$ is (x + 1), find the other factors.

a) (x – 5)(x – 7) b) (x + 5)(x + 7) c) (x + 5)(x – 7) d) (x – 5)(x + 7)

42. Given one factor of $x^3 + 2x^2 - 11x - 12$ is x + 1 find the other factors.

A) (x + 3)(x – 4) B) (x – 3)(x + 4) C) (x + 1)(x – 12) D) (x + 6)(x – 2)

43. Find the zeros of the function: $y = 5(x + 7)(x + 1)(2x - 3)$

a) 5, -7, -1, $-\frac{3}{2}$ b) 5, 7, 1, 2, -3 c) -7, -1, $\frac{3}{2}$ d) -7, -1, 3

44. Find the zeros of this fuction: y = 4x(x + 2)(x – 3)(2x – 5)

A) -2, 3, 5 B) 0 -2, 3, 5 C) -2, 3, $\frac{5}{2}$ D) 0, -2, 3, $\frac{5}{2}$

45. If $(x+4)$ is a factor of $3x^2+10x+k$, what is the value of *k* ?

A) -8 B) 8 C) 7 D) -7 E) 12

46. If (x – 4) is a factor of $2x^2 - 11x + k$, what is the value of *k*?

A) 16 B) 12 C) -9 D) -12 E) 3

47. Write the third degree polynomial function that would have the given zeros: -2, -4i

A) $x^2 - 4ix - 2x + 8i$ B) $x^3 + 2x^2 + 16x + 32$
C) $x^2 + 4ix + 2x + 8i$ D) $x^3 - 2x^2 + 16x - 32$

48. Write the third degree polynomial function that would have the given zeros: 3, 2i

A) $x^3 + 3x^2 - 4x + 12$ B) $x^3 + 4x^2 - 3x + 12$
C) $x^3 - 3x^2 + 4x - 12$ D) $x^2 + x - 7$

49. Simplify: $\sqrt{32}+\sqrt{18}-2\sqrt{3}+\sqrt{27}$

a) $\sqrt{77}-2\sqrt{3}$ b) $5-\sqrt{3}$ c) $7\sqrt{5}$ d) $7\sqrt{2}+\sqrt{3}$

50. Simplify: $3\sqrt{8}-7\sqrt{12}+\sqrt{75}-\sqrt{32}$

A) $10\sqrt{2}-19\sqrt{3}$ B) $2\sqrt{2}-9\sqrt{3}$ C) $8\sqrt{2}-3\sqrt{5}$ D) $-1\sqrt{-5}$

51. Simplify: $\sqrt{-40}$

a) $2i\sqrt{10}$ b) $2\sqrt{10}$ c) $20i$ d) $-2\sqrt{10}$

52. Simplify: $\sqrt{-72}$

A) -72i B) $i\sqrt{-72}$ C) $-6i\sqrt{2}$ D) $6i\sqrt{2}$

53. Simplify: $(7a^4b^7c)^2$

a) $7a^8b^{14}c^2$ b) $49a^6b^9c^2$ c) $14a^8b^{14}c^2$ d) $49a^8b^{14}c^2$

54. Simplify: $(-2r^3s^2t)^4$

A) $16r^7s^6t^4$ B) $16r^{12}s^8t^4$ C) $-2r^7s^6t^4$ D) $2r^{12}s^8t^4$

55. Simplify: $\frac{6x^5y^{-2}}{9x^2y^3}$

a) $\frac{2y^3}{3x^5}$ b) $\frac{2x^3}{3y^5}$ c) $\frac{y^3}{3x^5}$ d) $\frac{2x^7}{3y}$

56. Simplify: $\frac{9x^8y^{-6}}{24x^4y^{-3}}$

A) $\frac{8y^3}{3x^4}$ B) $\frac{3x^4}{8y^3}$ C) $\frac{3x^2}{8y^2}$ D) $\frac{3x^4y^3}{8}$

57. Write $\sqrt[3]{x^4}$ using exponents.

a) $x^{\frac{3}{4}}$ b) $3x^4$ c) $4x^3$ d) $x^{\frac{4}{3}}$

58. Write $\sqrt[7]{c^4}$ using exponents

A) $c^{\frac{7}{4}}$ B) $7c^4$ C) $c^{\frac{4}{7}}$ D) c^{11}

59. Simplify: $27^{\frac{4}{3}}$

a) 81 b) 36 c) 9 d) 6

60. Simplify: $27^{\frac{4}{3}}$

A) 11.84 B) 9 C) 81 D) 36

61. Simplify using the properties of exponents: $x^{\frac{2}{3}}x^{\frac{1}{2}}$

a) $x^{\frac{2}{5}}$ b) $x^{\frac{3}{5}}$ c) $x^{\frac{7}{6}}$ d) $x^{\frac{1}{2}}$

62. Simplify using properties of exponents: $x^{\frac{3}{5}} \cdot x^{\frac{1}{4}}$

A) $x^{\frac{3}{20}}$ B) $x^{\frac{4}{20}}$ C) $x^{\frac{4}{9}}$ D) $x^{\frac{17}{20}}$

63. Solve: $\sqrt{x-9}+14=20$

a) 27 b) 45 c) 207 d) 225

64. Solve: $\sqrt{x+3}+4=13$

A) 6 B) 78 C) 150 D) 162

65. $f(x) = 3x^2 - x + 5$ $g(x) = -6x^2 + 5x - 4$ find $(f - g)(x)$

66. If $f(x) = -2x + 7$ and $g(x) = x^2 - 4$ find $(f*g)(-1)$

A) -5 B) -27 C) -1 D) 5

67. If $f(x) = 2x^2 - x - 3$ and $g(x) = \sqrt[3]{x}$ what is the value of $\frac{g(8)}{f(-3)}$?

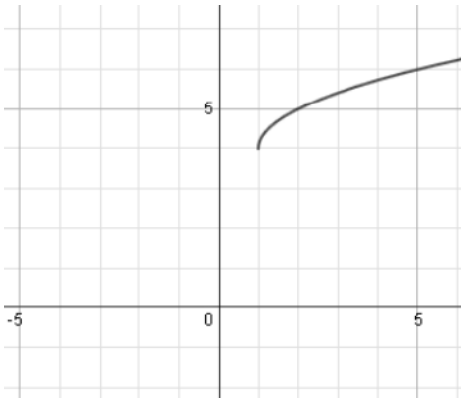
a) $\frac{1}{6}$ b) $\frac{1}{9}$ c) $\frac{2}{9}$ d) $\frac{1}{3}$

68. If $f(x) = x^2 - 2x + 7$ and $g(x) = -\sqrt{x}$ what is the value of $\frac{g(9)}{f(-2)}$?

A) -3 B) 3 C) $-\frac{3}{7}$ D) $\frac{1}{5}$ E) $-\frac{1}{5}$

69. Graph: $g(x) = \sqrt{x-1}+4$

A)



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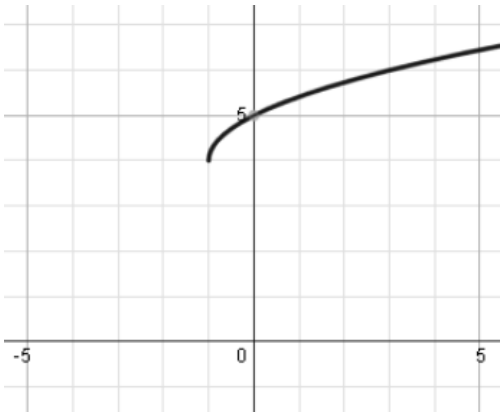

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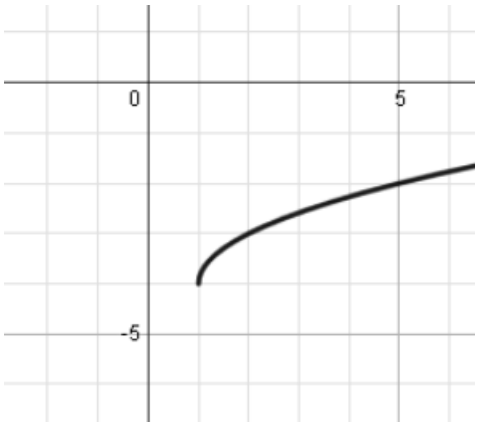

D)