EOC Review- Unit 5 2017:

Schoolnet Problems to Practice:

Standard	What is it?	Practice Problems
A-APR.1	Adding, subtracting & multiplying polynomials	Below
A-APR.3	Understand the relationships among the factors/ solutions/zeros of a quadratic expression/equation	Below
A-REI.4	Solve for the real solutions of quadratic equations in one variable by taking square roots and factoring	Below
A-SSE.3	Factoring quadratics to reveal the solutions/zeros	Below
F-IF.4	*Quadratics/Linear/Exponential Functions:* Comparing intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums when given in the form of graphs, tables, or verbal description	Below
F-IF.7	-Analyze Graphs linear, exponential, and quadratic functions -Including: domain & range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums &minimums;	Below
F-IF.8	Quadratic & Exponential Word Problems: a. **Rewrite** a *quadratic function* to reveal and **explain** different key features of the function b. **Interpret and explain** growth and decay rates for an *exponential function*.	Below
F-IF.9	*Quadratics/Linear/Exponential Functions:* Compare key features of two functions each with a different representation (symbolically, graphically, numerically in tables, or by verbal descriptions).	Below
A-SSE.1	*Quadratics/Linear/Exponential Functions:* Identify & interpret parts of a linear, exponential, or quadratic expression, including terms, factors, coefficients, and exponents.	Below
A-REI.1	Justify a chosen solution method and each step of the solving process for linear and quadratic equations using mathematical reasoning.	Below

EOC Practice Problems

A-APR.1 Practice:

1. **What is the difference of $(7x^2+3x-5)$ and $(2x^2-2x-6)$?**

   A. $-5x^2-5x-1$
   B. $5x^2+5x+1$
   C. $5x^2+x-11$
   D. $9x^2+x-11$

2. **What is $(2x-7)-(x-9)$?**

   A. $x-16$
   B. $x+2$
   C. $3x-16$
   D. $3x+2$

3. **What is the simplest form of this expression?**

   $(-2y^2+8)+(3y^2-1)$

   A. $-6y^4+26y^2-8$
   B. y^2+7
   C. y^4+7
   D. $8y^2$

7. **Which polynomial is equivalent to $b^2(3b^4-6b+9)$?**

   A. $3b^8-6b^2+9b^2$
   B. $3b^8-6b^2+9$
   C. $3b^6-6b^3+9$
   D. $3b^6-6b^3+9b^2$

9. **Which expression is equivalent to $(3y+3)+(y^2-1)+2y+(y^2+2)$?**

   A. $7y+4$
   B. $7y+6$
   C. $2y^2+5y+4$
   D. $3y^2+3y+4$

13. All the rectangular public-information signs in a shopping center are built such that, for some integer x, they are $(x+4)$ feet high and (x^2-4x+7) feet wide. In order for painters to paint a sign, they must first calculate the area. Which expression represents the area, in square feet, of each sign?

   A. $x^3+8x^2+23x+28$

   B. $x^3-9x+28$

   C. x^3-4x^2+7x

   D. x^3-16x

15. **What is the simplest form of $(6x - 7)(4x + 5)$?**

A. $24x^2 - 58x - 35$
B. $24x^2 - 2x - 35$
C. $24x^2 + 2x - 35$
D. $24x^2 + 58x - 35$

18. **The perimeter of a triangle is $17x - 5$ units. One side is $3x + 5$ units and another is $8x - 3$ units. How many units long is the third side?**

A. $6x - 7$
B. $6x - 13$
C. $12x - 7$
D. $22x - 23$

25. **Which is equivalent to $(3x + y^2)^2$?**

A. $9x^2 + 6xy^2 + y^4$
B. $9x^2 + 3xy^2 + y^4$
C. $9x^2 + y^4$
D. $6x + 2y^2$

48. Which expression is equivalent to $(x^2 - 1)(x^3 + 1)$?

A. $x^5 - 1$
B. $x^6 - 1$
C. $x^5 - x^3 + x^2 - 1$
D. $x^6 - x^3 + x^2 - 1$

75. The heights and bases of two geometric shapes are modeled by the expressions shown.

Triangle: $h = 3x + 2$ and $b = 2x + 3$

Parallelogram: $h = 3x + 4$ and $b = 3x + 2$

What expression represents the number of units by which the area of the parallelogram is greater than the area of the triangle?

A. $6x^2 + 5$

B. $6x^2 + 11$

C. $6x^2 + \frac{23}{2}x + 5$

D. $6x^2 + \frac{49}{2}x + 11$

A-APR.3 Practice:

1. What are all the zeros of this polynomial?

$y = x(x+1)(x-2)^2(x+8)^3$

A. $1, -2$, and 8

B. $-1, 2$, and -8

C. $0, 1, -2$, and 8

D. $0, -1, 2$, and -8

4. Let $p(x) = -x^2+5x-4$. Which statement describes the graph of $p(x)$?

A. The graph has no x-intercepts and opens upward from its vertex, the minimum point.

B. The graph has 2 x-intercepts and opens downward from its vertex, the maximum point.

C. The graph has 2 x-intercepts and opens upward from its vertex, the minimum point.

D. The graph has no x-intercepts and opens downward from its vertex, the maximum point.

5. **What is the *x*-intercept of the graph of** $y = (x-5)^2$?

A. -25

B. -5

C. 5

D. 25

10. **Which set of ordered pairs represents the *x*-intercepts of the function** $y = (x-5)(2x+3)$?

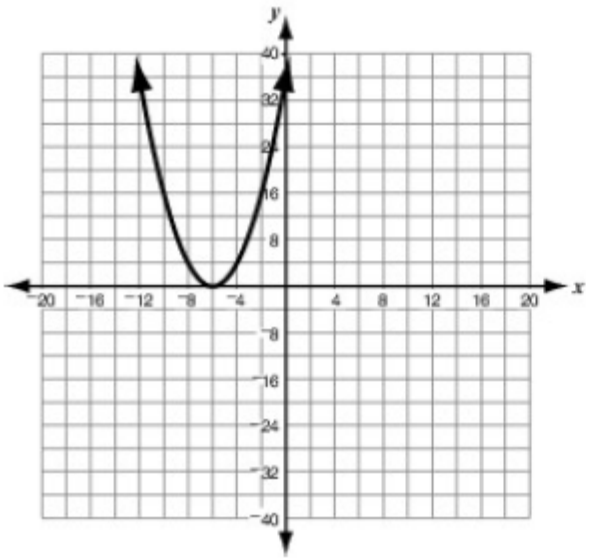
A. $(-5, 0)$ and $\left(\frac{3}{2}, 0\right)$

B. $(0, -5)$ and $\left(0, \frac{3}{2}\right)$

C. $(0, 5)$ and $\left(0, -\frac{3}{2}\right)$

D. $(5, 0)$ and $\left(-\frac{3}{2}, 0\right)$

21. Which function, when graphed, would have the same zero(s) as the function below?



A. $f(x) = x(x + 6)$

B. $f(x) = x(x - 6)$

C. $f(x) = (x + 6)^2$

D. $f(x) = (x - 6)^2$

22. **Which of the following functions has the same set of zeros as the function** $f(x) = x^2 - 6x + 8$?

A. $g(x) = x - 4$

B. $g(x) = x^2 - 5x + 6$

C. $g(x) = 2x^2 - 12x + 16$

D. $g(x) = x^3 - 6x^2 + 8x$

27. A toy rocket is launched vertically upward from a height of 96 feet above the ground. The height, *h*, of the rocket above the ground after *t* seconds is given by the function $h(t) = -16t^2 + 80t + 96$. Which equation can be used to find the time it takes for the rocket to return to the height from which it was launched?

A. $-16(t + 3)(t + 2) = 0$

B. $-16(t - 6)(t + 1) = 0$

C. $-16(t - 5) = 0$

D. $-16(t + 5) = 0$

29. **The roots of a quadratic equation are 6 and $\frac{3}{4}$. If one of the two factors of the equation is $x - 6$, what is the second factor?**

A. $3x - 4$
B. $3x + 4$
C. $4x - 3$
D. $4x + 3$

A-REI.4 Practice:

1. **What are the solutions to the equation $3x^2 - 45x = 0$?**

A. $x = -15$ and $x = 0$
B. $x = 0$ and $x = 15$
C. $x = 0$ and $x = 45$
D. $x = -45$ and $x = 0$

2. **Which function is related to the quadratic equation that has –6 as its only solution?**

A. $f(x) = x^2 + 12x + 36$
B. $f(x) = x^2 - 12x + 36$
C. $f(x) = x^2 - 36$
D. $f(x) = x^2 + 6$

4. **Which value of *x* is a solution to $x^2 + 8x - 16 = 0$?**

A. $x = -8$
B. $x = -4$
C. $x = 4$
D. $x = 8$

9. **For what values of *t* does $(6 + t)(1 - t) = 10$?**

A. -9 and 4
B. -6 and 1
C. -4 and -1
D. 2 and 3

10. **What are the solutions to $x^2 - 6x + 10 = 0$?**

A. $x = 2$ and $x = 4$
B. $x = -10$ and $x = -4$
C. $x = 3 + i$ and $x = 3 - i$
D. $x = -3 + i$ and $x = -3 - i$

15. **What are the solutions to $0 = x^2 - 18x + 32$?**

A. $x = -3$ and $x = 6$
B. $x = -2$ and $x = 9$
C. $x = 2$ and $x = 16$
D. $x = 4$ and $x = 8$

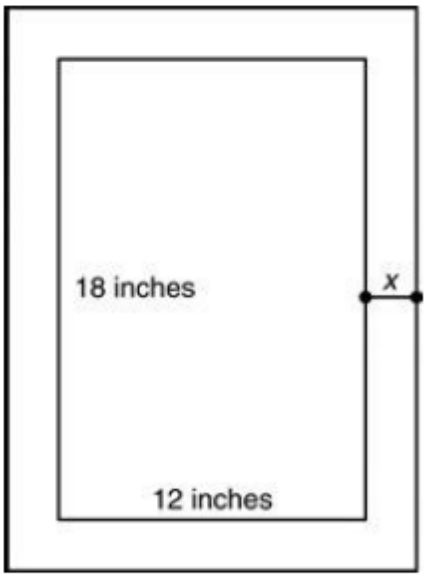
20. **What is the solution set for the equation $x^2 - 9 = 0$?**

A. $\{3\}$
B. $\{9\}$
C. $\{-3, 3\}$
D. $\{-9, 9\}$

41. **Using factoring, which value of *x* is a possible solution to the equation $3x^2 + 15x = 0$?**

A. $x = -15$
B. $x = -5$
C. $x = -3$
D. $x = 5$

55. **A frame *x* inches wide is shown around a 12-inch by 18-inch rectangular picture. The area of the framed picture can be represented by the expression $(2x + 12)(2x + 18)$.**



What is the width of the frame if the area of the framed picture is 391 square inches?

A. $2\frac{1}{2}$ inches
B. $3\frac{1}{2}$ inches
C. $12\frac{1}{2}$ inches
D. $17\frac{1}{2}$ inches

64. **For which values of *x* is this equation true?**

$$(x - y)^2 = z$$

A. $\{y \pm z\}$
B. $\{y \pm \sqrt{z}\}$
C. $\{-y \pm z\}$
D. $\{-y \pm \sqrt{z}\}$

A-SSE.3 Practice:

1. Which of these is a factor of the function $g(x) = 3x^2 + 2x - 1$?

   A. $(3x - 1)$

   B. $(3x + 1)$

   C. $(x - 1)$

   D. $(x + 3)$

2. **What are the *x*-intercepts of the quadratic equation** $y = 4x^2 - 27x + 18$?

   A. $\frac{-3}{4}$ and -6

   B. $\frac{3}{4}$ and 6

   C. 18

   D. $24\frac{3}{8}$ and $29\frac{5}{8}$

3. **Which expression is equivalent to** $9x^2 - 30x + 25$?

   A. $(9x - 5)(x - 5)$

   B. $(9x - 25)(x - 1)$

   C. $(3x - 5)(3x + 5)$

   D. $(3x - 5)(3x - 5)$

4. **What is the factored form of** $3p^3 + 27p^2 + 24p$?

   A. $3p(p - 1)(p - 8)$

   B. $3p(p + 1)(p + 8)$

   C. $3p(p - 2)(p - 4)$

   D. $3p(p + 2)(p + 4)$

5. **Which expression represents the factors of** $4z^2 - 49$?

   A. $(2z - 7)^2$

   B. $(4z - 7)^2$

   C. $(2z - 7)(2z + 7)$

   D. $(4z - 7)(4z + 7)$

6. **Which statement about the linear factors and zeros of a quadratic function is always true?**

   A. The constants of the linear factors are the opposite of the function's zeros.

   B. A function's zeros can be determined by setting each linear factor equal to 0 and solving.

   C. If a function's zero is an integer, then the coefficient of the variable in the linear factor must be one.

   D. Multiplying the constants of the linear factors gives one of the function's zeros, and adding the constants gives the other zero.

9. **A square has an area of** $49x^2 - 56x + 16$ **square meters. Which expression represents the length of each side, in meters?**

   A. $7x - 4$

   B. $7x + 4$

   C. $28x - 16$

   D. $(28x - 16)^2$

10. **Which binomial is factored correctly?**

A. $2x^2 - 81 = (x - 9)(x + 9)$

B. $9x^2 - 14 = (3x - 7)(3x + 7)$

C. $10x^2 - 9 = (5x - 3)(5x + 3)$

D. $36x^2 - 1 = (6x - 1)(6x + 1)$

11. **Which of the following is equivalent to** $4x^2 - 12x + 9$?

A. $(2x - 3)^2$

B. $(2x + 3)^2$

C. $(-2x - 3)^2$

D. $(2x + 3)(2x - 3)$

14. **Which expression shows a complete factorization of** $6y^2 + 16$?

A. $2(3y^2 + 4)$

B. $2(3y^2 + 8)$

C. $2(3y^2 + 4)^2$

D. $2(3y^2 + 8)^2$

23. **The factored form of a quadratic expression is $(x + a)(x + b)$, where a and b represent positive constants. Which statement describes how to determine one zero of the related quadratic function?**

A. Find the sum of the two constants.

B. Find the opposite of one of the constants.

C. Find the difference between the two constants.

D. Find the ratio of the smaller to the larger constant.

83. **The zeros of a quadratic function are located at (3, 0) and (–4, 0). Which product shows the linear factors of this function's equation?**

A. $(x + 3)(x - 4)$

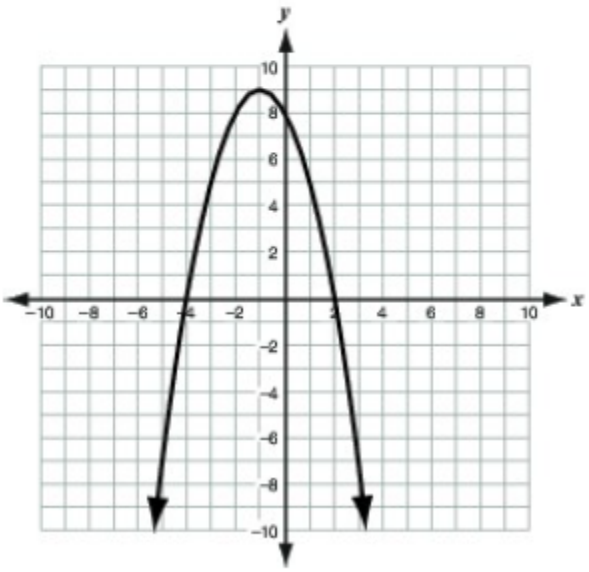
B. $(x - 3)(x + 4)$

C. $(x - 3)(x - 4)$

D. $(x + 3)(x + 4)$

F-IF.4 Practice:

4. Use the function graphed on the coordinate plane below.



What are the intervals where the function is decreasing and increasing?

A. The function decreases from $(-\infty, 9)$ and increases from $(9, \infty)$.

B. The function decreases from $(9, \infty)$ and increases from $(-\infty, 9)$.

C. The function decreases from $(-1, \infty)$ and increases from $(-\infty, 1)$.

D. The function decreases from $(-\infty, -1)$ and increases from $(-1, \infty)$.

9. A ball is thrown straight up with a speed of 32 feet per second, reaching a height of h feet after t seconds. The height of the ball is modeled by the function $h = 32t - 16t^2$. After how many seconds does the ball fall back to the same height it attained a half-second after it was thrown?

A. 1 second

B. 1.25 seconds

C. 1.5 seconds

D. 1.75 seconds

10. **What are the *x*- and *y*-intercepts of the graph of $-2x + y = 6$?**

A. *x*-intercept $= -6$ and *y*-intercept $= 3$

B. *x*-intercept $= -3$ and *y*-intercept $= 6$

C. *x*-intercept $= 3$ and *y*-intercept $= -6$

D. *x*-intercept $= 6$ and *y*-intercept $= -3$

11. The height of a ball, in feet, t seconds after it is thrown into the air is modeled by the function $h(t) = -16t^2 + 45t + 4$. ***Approximately*** what is the maximum height of the ball?

A. 4 feet

B. 33 feet

C. 36 feet

D. 45 feet

17. **Which ordered pair represents the *x*-intercept of the graph of $y = \frac{3}{4}x + 6$?**

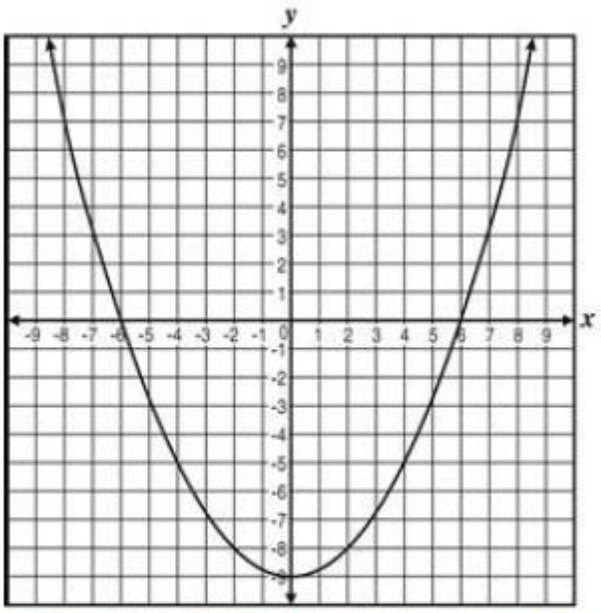
A. $(-8, 0)$

B. $(0, -8)$

C. $(0, 6)$

D. $(6, 0)$

22. **The graph of parabola $y = 0.25x^2 - 9$ is shown on the coordinate plane below.**



According to the graph, for which values of *x* is *y* always negative?

A. $x > 0$

B. $x < -9$

C. $x < -6 \text{ and } x > 0$

D. $x > -6 \text{ and } x < 6$

26. The height, in feet, of an arrow shot from a bow in an upwards direction, is modeled by the function $f(t) = -16t^2 + 96t + 5$, where t represents the time in minutes. During which interval is the arrow going up?

A. $0 < t < 3$

B. $3 < t < 6$

C. $5 \leq t \leq 149$

D. $16 < t < 96$

31. **What are the *x*- and *y*-intercepts of the graph** of the equation $3x - 4y = -1$?

A. $x-\text{intercept: } -\frac{1}{3};\ y-\text{intercept: } -1$

B. $x-\text{intercept: } \frac{1}{4};\ y-\text{intercept: } -1$

C. $x-\text{intercept: } -\frac{1}{3};\ y-\text{intercept: } \frac{1}{4}$

D. $x-\text{intercept: } \frac{1}{4};\ y-\text{intercept: } -\frac{1}{3}$

94. A ball is thrown in the air from a platform at time $t = 0$ seconds. The height, $h(t)$, of the ball can be modeled as a function of time, t, by the equation $h(t) = -16t^2 + 40t + 20$. Approximately how many seconds after being thrown will the ball hit the ground?

A. 0.13 second

B. 1.25 seconds

C. 2.37 seconds

D. 2.93 seconds

157. During which interval is the function $f(x) = x^2 - 9$ decreasing?

A. $x < 0$

B. $x > 0$

C. $x < 3$

D. $x > 3$

180. A rock is thrown up from the ground at a velocity of 84 feet per second. The formula $h = -16t^2 + 84t$ gives the rock's height in feet after t seconds. What is the maximum height of the rock?

A. 68 feet

B. 84 feet

C. 110 feet

D. 179 feet

F-IF.7 Practice:

2. **What is the *y*-intercept of the line that passes through the points (1, 0) and (2, −2)?**

A. −2

B. −1

C. 1

D. 2

3. **Which quadratic function opens upward and has its vertex at $x = 6$?**

A. $f(x) = -4x^2 + 48x - 18$

B. $f(x) = -2x^2 + 24x + 12$

C. $f(x) = 3x^2 - 36x + 9$

D. $f(x) = 6x^2 - 8x + 5$

4. **In the graph of the equation $y = x^2 + 2ax$, which expression represents the minimum?**

A. (a, a^2)

B. $(-a, a^2)$

C. $(-a, -a^2)$

D. It has no minimum.

7. **What are the coordinates of the *x*-intercepts of the parabola $y = x^2 - 8x + 15$?**

A. (3, 0) and (5, 0)

B. (3, 0) and (–5, 0)

C. (–3, 0) and (5, 0)

D. (–3, 0) and (–5, 0)

19. **Which of the following is represented by a graph that opens downward and has its vertex at (8, 36)?**

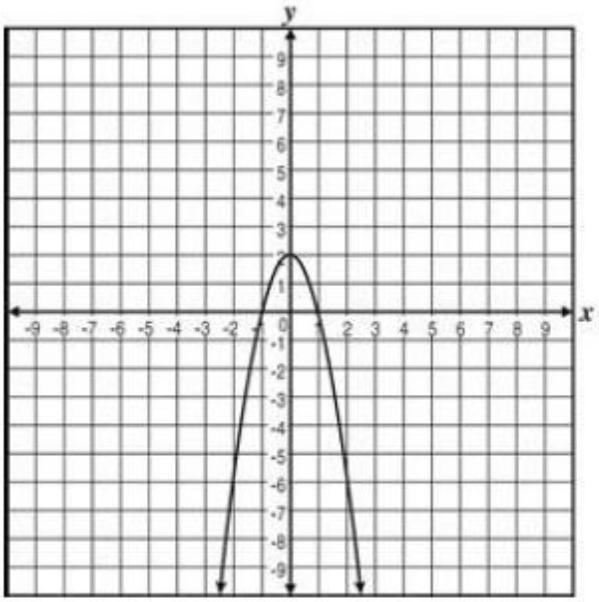
A. $y = -8x^2 + 36x$

B. $y = 36x^2 - 8x$

C. $y = -\frac{1}{2}x^2 + 8x + 4$

D. $y = \frac{1}{2}x^2 - 8x + 4$

44. **Which describes the zeros and maximum of this graph?**



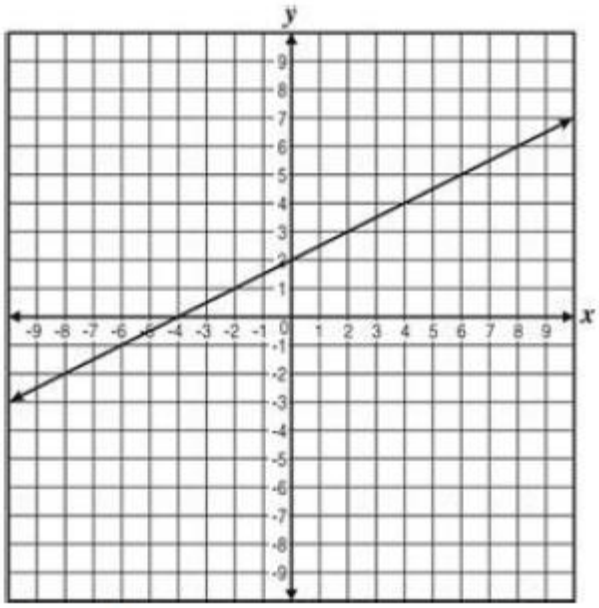
A. Zeros are –2 and 2; maximum is 6.

B. Zeros are –6 and 6; maximum is 1.

C. Zeros are –1 and 1; maximum is 2.

D. Zero is 2; maximum is 0.

47. **What is the equation of the line below?**



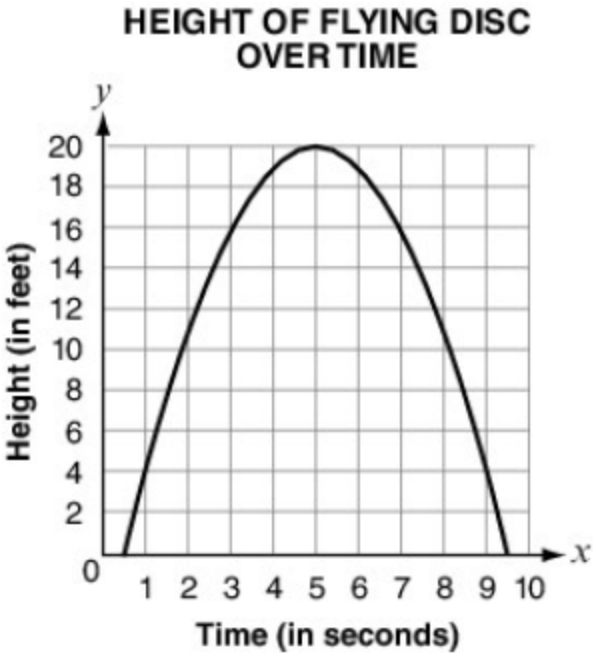
A. $y = \frac{1}{2}x + 2$

B. $y = \frac{1}{2}x - 2$

C. $y = 2x + 2$

D. $y = 2x - 2$

56. A flying disc is thrown up in the air. The graph below shows its height after t seconds.



Which of these statements is true?

A. The disc reaches its minimum height of 5 feet at 20 seconds.

B. The disc reaches its maximum height of 5 feet at 20 seconds.

C. The disc reaches its minimum height of 20 feet at 5 seconds.

D. The disc reaches its maximum height of 20 feet at 5 seconds.

69. **What are the coordinates of the vertex of the parabola** $y = x^2 + 4x - 6$?

A. $(-4, 6)$

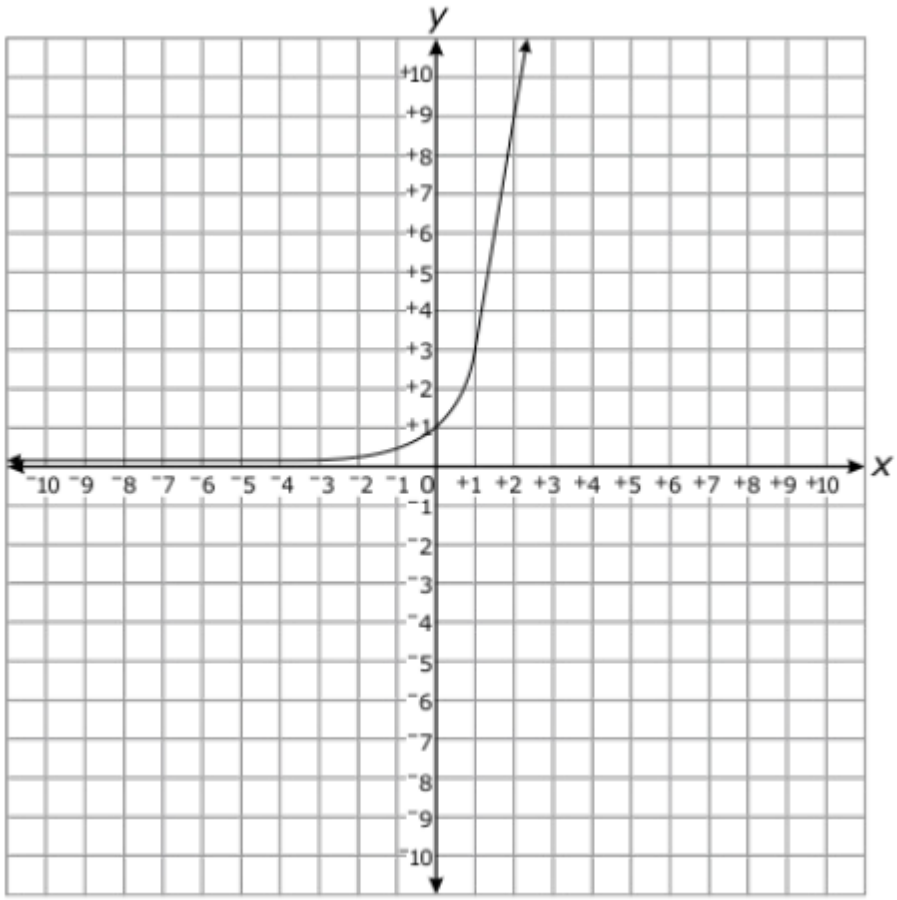
B. $(-2, -10)$

C. $(2, 6)$

D. $(4, -6)$

101. Which is the graph of $y = 3^x$?

A.


y
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+7
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+4
+3
+2
+1
−10 −9 −8 −7 −6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
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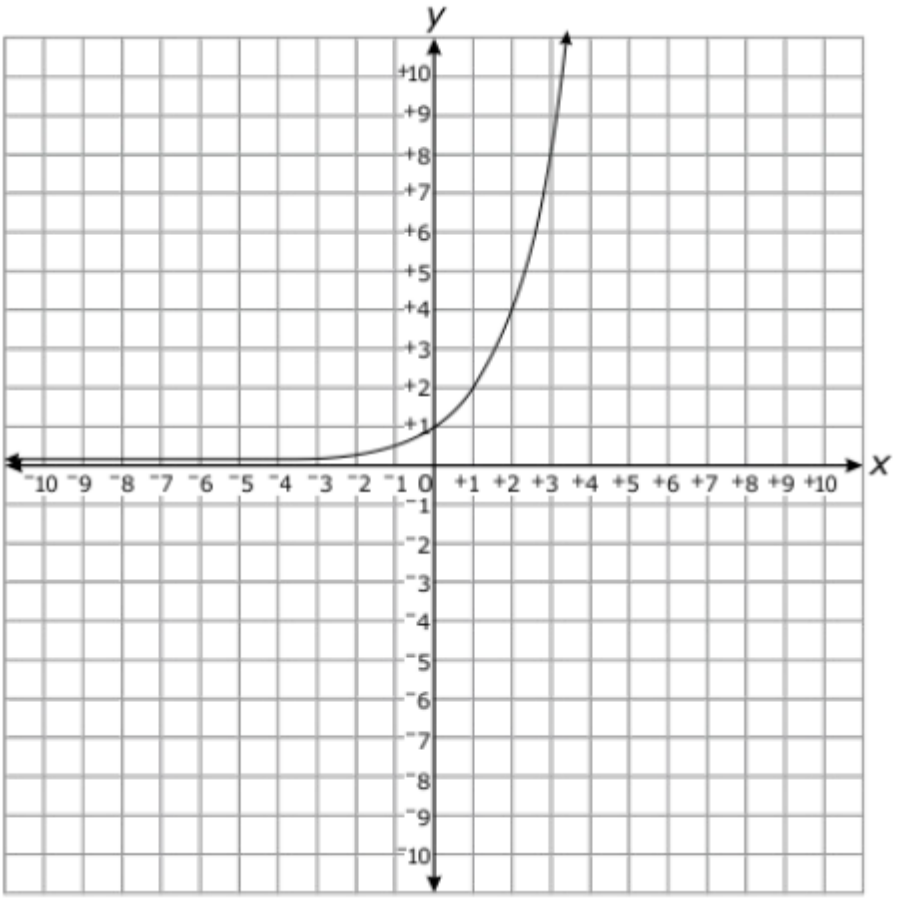
B.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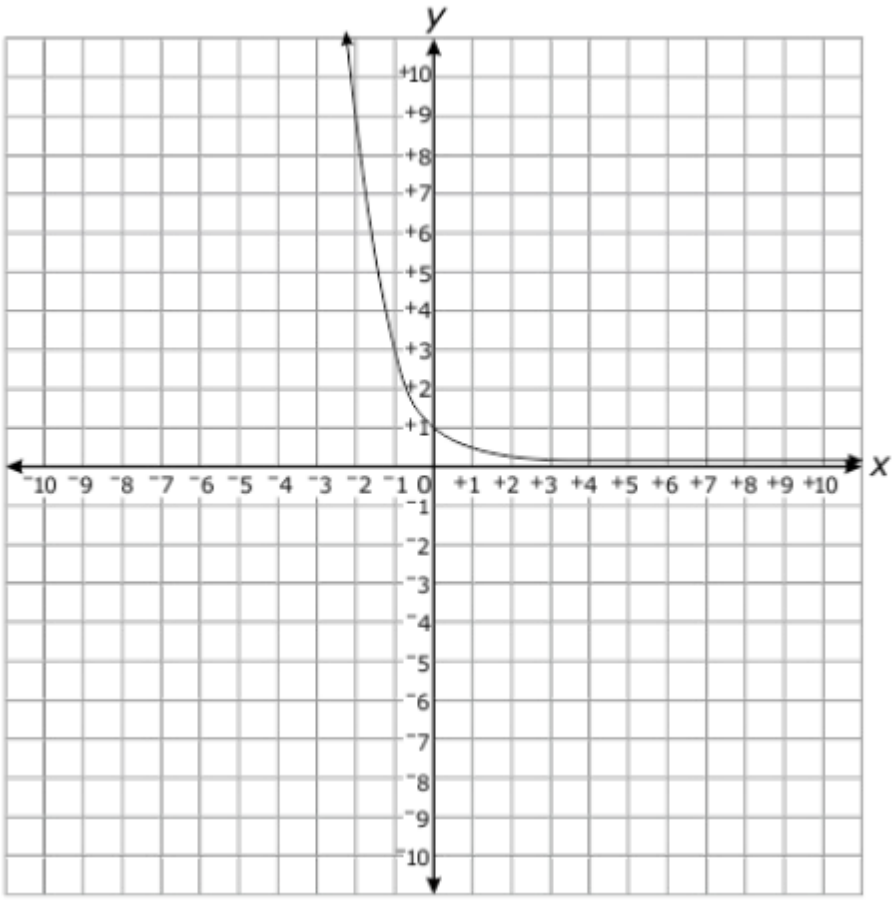
C.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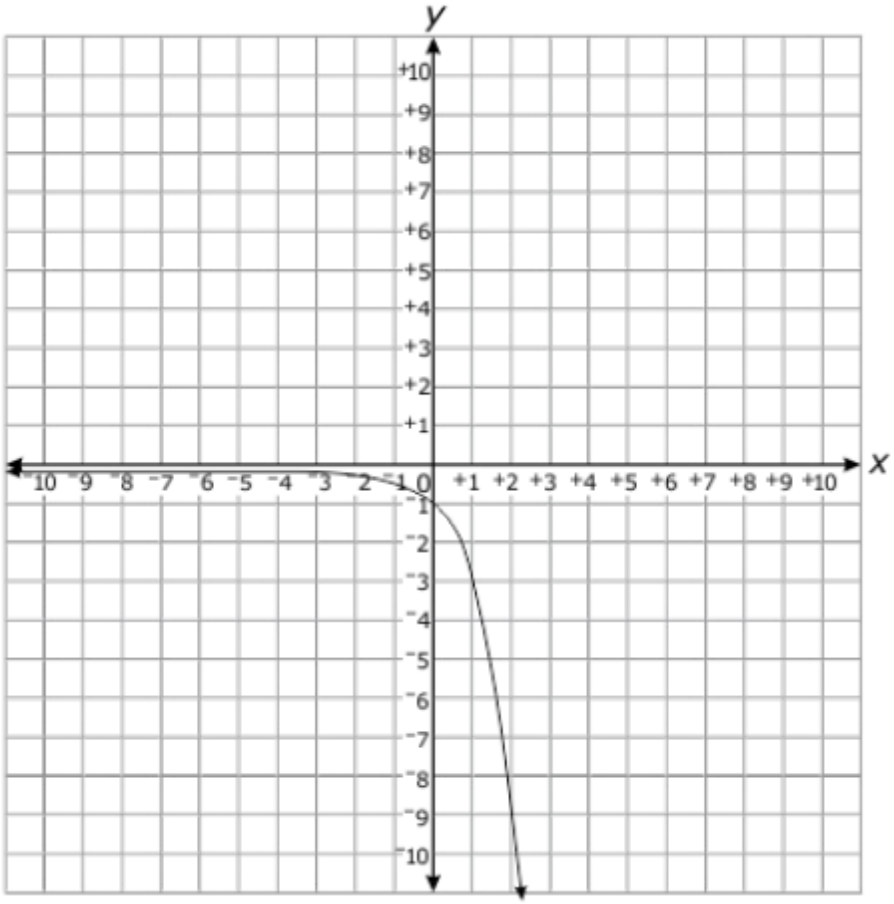
D.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−1
−2
−3
−4
−5
−6
−7
−8
−9
−10

F-IF.8 Practice:

2. James kicked a ball off the ground into the air. The function $h(t) = -16t^2 + 40t$ models the height (in feet) of the ball t seconds after it was kicked. How long did it take the ball to hit the ground after being kicked?

   A. 1.25 seconds

   B. 2.5 seconds

   C. 4 seconds

   D. 10 seconds

5. The function $h(t) = -16t^2 + 16t + 32$ models the height of a ball t seconds after it was thrown into the air. How long does it take for the ball to hit the ground?

   A. 1 second

   B. 2 seconds

   C. 4 seconds

   D. 8 seconds

6. **How many times does the graph of the quadratic function $f(x) = x^2 - 9$ intersect the *x*-axis?**

   A. 0
   B. 1
   C. 2
   D. 3

10. Which function has an axis of symmetry at $x = 3$?

    A. $y = x^2 - 9$

    B. $y = x^2 + 6x + 9$

    C. $y = x^2 - 6x + 9$

    D. $y = x^2 - 36$

27. A rocket is launched into the air at a velocity, v, of 96 feet per second. Its height can be modeled by the equation $h = vt - 16t^2$, where t is the time in seconds and h is the height. How long will it take for the rocket to reach its highest point?

A. 2 seconds

B. 3 seconds

C. 6 seconds

D. 7 seconds

35. A company produces swimming pools. Its daily cost can be modeled with the function $P(x)=20x^2 - 240x$, where x is the number of swimming pools produced. If the company makes at least 1 pool a day, how many pools need to be produced for the company to break even?

A. 3

B. 6

C. 12

D. 15

75. The value of a set of cooking dishes can be modeled with the function $f(x) = 900(0.9012)^{\left(\frac{5}{6}x\right)}$, where x represents the number of years since th dishes were purchased. Which statement ***best*** describes the value of th dishes over time?

A. The value of the dishes is increasing by 90.12% each year.

B. The value of the dishes is decreasing by 9.8% each year.

C. The value of the dishes is increasing by approximately 91.7% each year.

D. The value of the dishes is decreasing by approximately 8.3% each year.

76. **Which function represents an initial population that increases 22% per year where *A* represents the initial value and *x* represents time in years?**

A. $y = A(0.22)^x$

B. $y = A(0.68)^x$

C. $y = A(1.22)^x$

D. $y = A(1.68)^x$

77. A scientist is observing the size of a sample of bacteria. The function $f(t) = 1{,}000(0.995)^t$ models the size of the sample t hours after the scientist began his observations. Which statement is true about the size of the sample?

A. The sample is growing at a rate of 99.5% per hour.

B. The sample is decaying at a rate of 99.5% per hour.

C. The sample is growing at a rate of 0.5% per hour.

D. The sample is decaying at a rate of 0.5% per hour.

79. Which function could represent a population that is growing at a rate of 15% per year, t?

A. $P = 1{,}500(0.85)^t$

B. $P = 0.85(1{,}500)^t$

C. $P = 1{,}500(1.15)^t$

D. $P = 1.15(1{,}500)^t$

91. The population of a town t years after 2000 is modeled by the function $P(t) = 37,000(0.97)^{\frac{t}{12}}$. At what rate is the population decreasing each year?

A. 0.25%

B. 0.69%

C. 3%

D. 9%

95. The function $p(x) = 104(1.09)^x$ models the population of blue birds in an area x years after 1980. At what rate is the population of blue birds increasing each year?

A. 4%

B. 9%

C. 91%

D. 96%

105. The value of a car x years after it was purchased is modeled by the function $f(x) = 15{,}550(0.84)^x$. Which ***best*** describes the value of the car?

A. The value of the car is decreasing by 16% each year.

B. The value of the car is increasing by 16% each year.

C. The value of the car is decreasing by 84% each year.

D. The value of the car is increasing by 84% each year.

F-IF.9 Practice:

1. Allison compared the y-intercept of $f(x) = 4 - 5x$ to the y-intercept of the function that fits the values in the table below.

x	$g(x)$
0	8
1	13
2	18
3	23

Which statement is true?

A. The y-intercept of $g(x)$ is half the y-intercept of $f(x)$.

B. The y-intercept of $g(x)$ is two times the y-intercept of $f(x)$.

C. The y-intercept of $g(x)$ is equal to the y-intercept of $f(x)$.

D. The y-intercept of $g(x)$ is the negative value of the y-intercept of $f(x)$.

3. Which statement is true about the function $f(x) = 6x + 2$ and the linear function that fits the values in the table below?

x	$g(x)$
$^{-}1$	8
1	$^{-}4$
3	$^{-}16$
5	$^{-}28$
7	$^{-}40$

A. $f(x)$ has the same slope as $g(x)$.

B. $f(x)$ has the same y-intercept as $g(x)$.

C. $f(x)$ has the same x-intercept as $g(x)$.

D. $f(x)$ and $g(x)$ are the same function.

5. Maria compared the maximum value of the function $f(x) = {}^{-}x^2 + 4x - 1$ to the maximum value of the quadratic function that fits the values shown in the table below.

x	$g(x)$
$^{-}5$	$^{-}41$
$^{-}4$	$^{-}20$
$^{-}3$	$^{-}5$
$^{-}2$	4

What is the value of the smaller maximum?

A. $^{-}41$

B. $^{-}1$

C. 3

D. 7

8. Patrick compared the function $f(x) = x^2 - 6x + 9$ to the function $g(x)$ equals the product of x plus 5 and the quantity x minus 2. Which statement is true about the two functions?

A. $f(x)$ has the smallest minimum value.

B. $g(x)$ has the largest y-intercept.

C. $f(x)$ has the largest root.

D. $g(x)$ has the largest x-intercept.

14. Janet compared the slope of $f(x) = 2 - 3x$ to the slope of the linear function that fits the values in the table below.

x	$g(x)$
1	8
2	14
3	20
4	26
5	32

Which statement correctly describes the slope of the two functions?

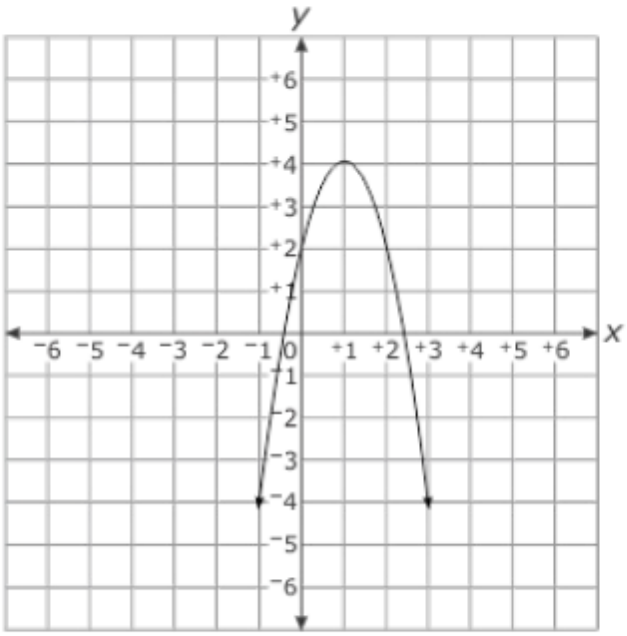
A. The slope of $f(x)$ and $g(x)$ are the same.

B. The slope of $f(x)$ is half the slope of $g(x)$.

C. The slope of $f(x)$ is twice the slope of $g(x)$.

D. The slope of $f(x)$ is half the opposite of the slope of $g(x)$.

26. Aaron compared the maximum value of $y = -2x^2 + 6x + 5$ to the maximum value of the function graphed below.



What is the x-value of the larger maximum?

A. 1

B. 1.5

C. 4

D. 9.5

27. Two new cars were purchased from Frank's Auto Yard. Car A's value n years after its purchase is found using the function $P(n) = 13{,}500(0.83)^n$. Car B's value in different years is shown in the table below.

Car B's Value

n	***Q(n)***
0	$17,000
2	$13,770
5	$10,038
7	$8,131

Using an exponential model, what is the ***approximate*** difference in the percent the two cars are depreciating?

A. 17%

B. 10%

C. 7%

D. 5%

38. Margaret compared the function $f(x) = \frac{x}{2} + 1$ to the function that fits the values in the table below.

x	***g(x)***
2	5
3	7
4	9
5	11

Which statement below is true?

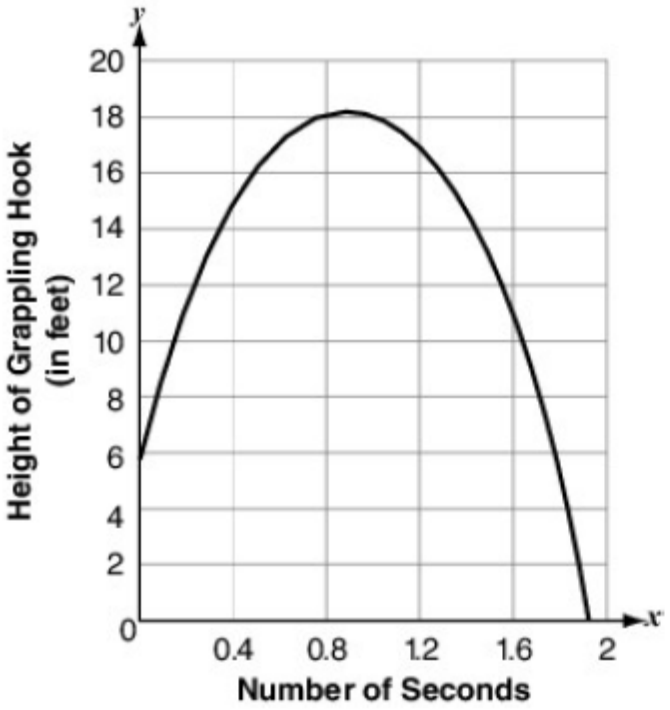
A. The slope of $f(x)$ is half the slope of $g(x)$.

B. The slope of $f(x)$ is twice the slope of $g(x)$.

C. The slope of $f(x)$ is one fourth the slope of $g(x)$.

D. The slope of $f(x)$ is four times the slope of $g(x)$.

41. Austin and Janda threw grappling hooks into the air. The function $f(x) = -16x^2 + 32x + 5$ gives the height, in feet, of Austin's hook x seconds after he threw it. The graph below shows the height, in feet, of Janda's hook x seconds after she threw it.



If both of them threw the grappling hooks at the same time, which of these statements is **true**?

A. Austin's hook hit the ground first.

B. Austin's hook reached its maximum height first.

C. Austin's hook reached a greater maximum height.

D. Austin threw the hook from a greater initial height.

A-SSE.1 Practice:

2. Which is the coefficient of the expression $-3a^2c^{-7}$?

A. -7

B. -3

C. 2

D. 3

4. **The expression $2T + 3F + 4M + 10E$ gives the number of points a student earns on a test when the student correctly answers *T* true-false questions, *F* fill-in-the-blank questions, *M* multiple-choice questions, and *E* extended-response questions. Which statement is not true?**

A. The coefficient 2 indicates that each correct true-false question earns 2 points.

B. The coefficient 3 represents the points earned for each fill-in-the-blank question.

C. The term $10E$ represents the total number of points earned from 10 extended-response questions.

D. The term $4M$ represents the total number of points earned from M multiple-choice questions worth 4 points per question.

6. **What is the coefficient of the second term of the expression $3x^4 + x^2$?**

A. 0

B. 1

C. 2

D. 3

8. Albert invested a total of \$5,000 in two different accounts. He invested part of it in Account A, which pays 7% simple interest every year, and the remaining in Account B, which pays 9% simple interest every year. If Albert invested x dollars in Account A, what does $(5{,}000 - x)0.09$ represent?

A. the amount of money in Account A in one year

B. the amount of money in Account B in one year

C. the amount of interest earned from Account A in one year

D. the amount of interest earned from Account B in one year

9. **What is the sum of the coefficients of the expression $3x^4 + 5x^2 + x$?**

A. 6

B. 7

C. 8

D. 9

11. The height in meters of a projectile involves the object's initial height, upward velocity, and acceleration because of gravity. If the equation $y = -9.8t^2 + 109.7t + 7.4$ models the number of meters, y, a toy rocket is above the ground t seconds after being launched, what does 7.4 represent?

A. initial height of the rocket

B. acceleration because of gravity

C. initial upward velocity of the rocket

D. total time the rocket travels after t seconds

13. The total cost of tiling a rectangular patio involves the cost of tiles and labor charges. The length of the patio is 5 feet more than its width, x. If the expression $10x(x+5)+300$ gives the total cost of tiling, what does 10 represent?

A. the labor charges

B. the total cost of the tiles

C. the area of the patio in square feet

D. the cost of the tiles per square foot

30. The population of a bacteria after x number of hours is modeled by the expression $1{,}000(0.75)^x$. What is the rate of decay of the population of bacteria?

A. 25%

B. 75%

C. 0.75%

D. 1.25%

32. The charge for parking at a particular state park is a dollars per vehicle plus b dollars per person in the vehicle. Which expression represents the charge for 3 vehicles with n people per vehicle at this state park?

A. $3a + bn$

B. $3a + \frac{3b}{n}$

C. $3(a + bn)$

D. $3(a + b)n$

A.REI.1 Practice:

1. **What process was used to obtain the equation shown in Step 2?**

   Step 1: $\frac{x}{5} - \frac{1}{6} = 2$

   Step 2: $6x - 5 = 60$

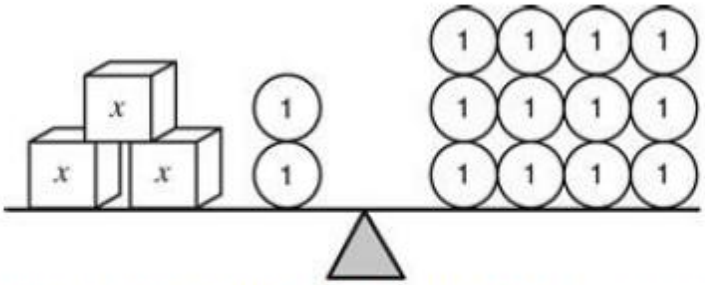
   A. added $\frac{1}{6}$ to both sides of the equation

   B. added 58 to both sides of the equation

   C. multiplied both sides of the equation by 30

   D. divided both sides of the equation by 30

2. **The model below represents the equation** $3x + 2 = 12$.



   What is the best first step in order to find the value of *x* in 2 steps?

   A. divide each side by $3x$

   B. add 2 to each side of the model

   C. add 12 to each side of the model

   D. subtract 2 from each side of the model

5. Jacob stated that he solved the equation $2x + 3 = 5$ using the addition and multiplication property of equality. Which statement is **true**?

   A. Jacob added -3 to both sides and multiplied both sides by $\frac{1}{2}$.

   B. Jacob added -3 to both sides and multiplied both sides by 2.

   C. Jacob added 3 to both sides and multiplied both sides by $\frac{1}{2}$.

   D. Jacob added 3 to both sides and multiplied both sides by 2.

7. The steps below are used to solve the equation $5(x-3)+2=2x-6$.

Step 1: $5x-15+2=2x-6$

Step 2: $5x-13-2x=-6$

Step 3: $5x-2x-13=-6$

Step 4: $3x=-6+13$

Step 5: $3x=7$

Step 6: $x=\frac{7}{3}$

Which of the following statements is **correct**?

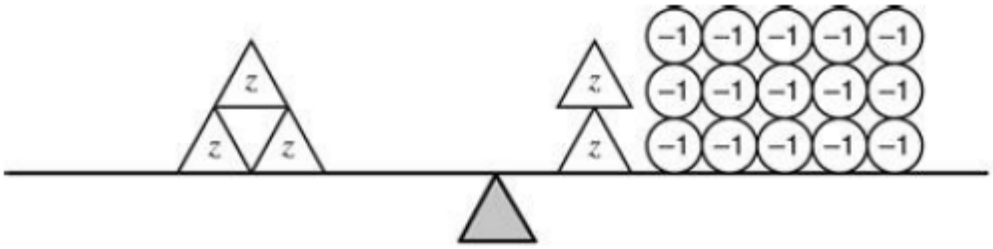
A. Step 1 is the result of applying the associative property of multiplication to the given equation.

B. Step 1 is the result of applying the associative property of addition to the given equation.

C. Step 3 is the result of applying the commutative property to the equation in step 2.

D. Step 3 is the result of applying the distributive property to the equation in step 2.

13. **The figure below models the equation** $3z=2z-15$.



What should be done to find the value of *z* in the first step?

A. subtract 2 triangles from each side

B. add 15 negative 1 circles to each side

C. divide both sides by the number of triangles on the left side

D. divide both sides by the number of triangles on the right side

17. The charges, C, in dollars from a taxi company for traveling a distance of x miles is represented by the equation $C = 3x + 2$. Which of the following is a possible step and valid explanation for the process of solving for x in terms of C?

A. $C = 3x + 2 - 2$; The subtraction equality property must first be used to transform the equation in terms of the miles traveled.

B. $C - 2 = 3x + 2 - 2$; The distributive property must first be used to simplify the charge equation.

C. $\frac{C - 2}{3} = 3x$; The commutative property must be used in the second step to prove that the sides of the charge equation are equal.

D. $\frac{C - 2}{3} = \frac{3x}{3}$; The division equality property must be used in the second step to isolate and solve for the number of miles traveled.