Name: _____Key_____   Date: _____

EOC Practice Problems

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1. Which expression is equivalent to $121x^2 - 64y^2$? *DOTS, or multiply the answers and check*

   A. $(11x - 16y)(11x + 16y)$
   B. $(11x - 16y)(11x - 16y)$
   C. $(11x + 8y)(11x + 8y)$
   D. $(11x + 8y)(11x - 8y)$ ⭕

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2. What is a common factor for the expression $24x^2 + 16x + 144$? $8(3x^2 + 2x + 18)$

   A. 16   B. $8x$ **C.** $3x^2 + 2x + 18$ ⭕   D. $8(x - 2)(3x^2 + 9)$

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3. Which of these shows the complete factorization of $6x^2y^2 - 9xy - 42$?

   $3\left(\dfrac{2x^2y^2 - 3xy - 14}{}\right)$

   $3(2xy - 7)(xy + 2)$

   A. $3(2xy^2 - 7)(xy^2 + 2)$ **C.** $3(2xy - 7)(xy + 2)$ ⭕

   B. $(3xy + 6)(2xy - 7)$ D. $(3xy^2 + 6)(2xy^2 - 7)$

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4. What are the zeros of the function represented by the quadratic expression $2x^2 + x - 3$?

   $(2x + 3)(x - 1) = 0$ or
   $2x + 3 = 0$ $x - 1 = 0$ Poly-solv
   $2x = -3$ $x = 1$
   $x = -\dfrac{3}{2}$

   A. $x = -3/2$ and $x = 1$ ⭕   C. $x = -1$ and $x = 2/3$

   B. $x = -2/3$ and $x = 1$ D. $x = -1$ and $x = -3/2$

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5. What is the vertex of the graph of $f(x) = x^2 + 10x - 9$? $h = \dfrac{-b}{2a} = \dfrac{-10}{2(1)} = \dfrac{-10}{2} = -5$

   $k = f(-5) = (-5)^2 + 10(-5) - 9 = -34$ or poly-solv

   A. (5, 66)   B. (5, -9)   C. (-5, -9)   **D.** (-5, -34) ⭕

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6. Which of these is the result of completing the square for the expression $x^2 + 8x - 30$? $= 0$

   $x^2 + 8x = 30$
   $x^2 + 8x + 16 = 30 + 16$
   $(x + 4)^2 = 46$
   $(x + 4)^2 - 46 = 0$

   A. $(x+4)^2 - 30$ **B.** $(x+4)^2 - 46$ ⭕   C. $(x+8)^2 - 30$ D. $(x+8)^2 - 94$

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7. The expression $-x^2 + 70x - 600$ represents a company's profit for selling x items. For which number(s) of items sold is the company's profit equal to 0?

   $-x^2 + 70x - 600 = 0$ or poly-solv
   $x^2 - 70x + 600 = 0$
   $(x - 10)(x - 60) = 0$

   A. 0 items   B. 35 items   **C.** 10 items and 60 items ⭕   D. 20 items and 30 items

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8. The formula for the area of a circle is $A = \pi r^2$. Which equation shows the formula in terms of r?

   $A = \pi r^2$
   $\dfrac{A}{\pi} = \dfrac{\pi r^2}{\pi}$
   $\dfrac{A}{\pi} = r^2$

   A. $r = \dfrac{2A}{\pi}$ B. $r = \dfrac{\sqrt{A}}{\pi}$ **C.** $r = \sqrt{\dfrac{A}{\pi}}$ ⭕   D. $r = \dfrac{A}{2\pi}$

   $\sqrt{\dfrac{A}{\pi}} = r$

9. What are the solutions to the equation $2x^2 - 2x - 12 = 0$?

   (handwritten: $\frac{2x^2}{2} - \frac{2x}{2} - \frac{12}{2}$)

   (handwritten: $x^2 - x - 6 = 0$)
   (handwritten: $(x-3)(x+2) = 0$ or poly-solv)
   (handwritten: $x = 3, -2$)

   A. $x = -4, x = 3$ B. $x = -3, x = 4$ C. $x = -2, x = 3$ *(circled)*   D. $x = -6, x = 2$

10. What are the solutions to the equation $6x^2 - x - 40 = 0$

    (handwritten: $(2x+5)(3x-8) = 0$)
    (handwritten: $2x+5=0$ $3x-8=0$ or poly-solv)
    (handwritten: $2x=-5$ $3x=8$)
    (handwritten: $x = -\frac{5}{2}$ $x = \frac{8}{3}$)

    A. $x = -8/3, x = -5/2$ C. $x = -8/3, x = 5/2$

    B. $x = 5/2, x = 8/3$ D. $x = -5/2, x = 8/3$ *(circled)*

11. What are the solutions to the equation $x^2 - 5x = 14$

    (handwritten: -14 -14)
    (handwritten: $x^2 - 5x - 14 = 0$)
    (handwritten: $(x-7)(x+2) = 0$ or poly-solv)
    (handwritten: $x-7=0$ $x+2=0$)
    (handwritten: $x = 7$ $x = -2$)

    A. $x = -7, x = -2$ C. $x = -2, x = 7$ *(circled)*

    B. $x = -14, x = -1$ D. $x = -1, x = 14$

12. An object is thrown in the air with an initial velocity of 5 m/s from a height of 9m. The equation $h(t) = -4.9t^2 + 5t + 9$ models the height of the object in meters after t seconds.

    (handwritten: $t = \frac{-(5) \pm \sqrt{(5)^2 - 4(-4.9)(9)}}{2(-4.9)} \approx -0.84, 1.96\ sec$ or poly-solv)

    About how many seconds does it take for the object to hit the ground? Round your answer to the nearest tenth of a second.

    A. 0.940 secs   B. 1.50 secs   C. 2.00 secs *(circled)*   D. 9.00 secs

13. What explicit expression can be used to find the next term in this sequence?

    2, 8, 18, 32, 50, ...   *(handwritten: Plus in 1,2,3,... See which matches)*

    A. $2n$ B. $2n + 6$ C. $2n^2$ *(circled)*   D. $2n^2 + 1$

14. The function $s(t) = vt + h - 0.5at^2$ represents the height of an object, s, in feet, above the ground in relation to the time, t, in seconds, since the object was thrown into the air with an initial velocity of v feet per second at an initial height of h feet and where a is the acceleration due to gravity (32 feet per second squared).

    (handwritten: $0 = 80t + 4 - 0.5(32)t^2 \Rightarrow 0 = -16t^2 + 80t + 4$)

    A baseball player hits a baseball 4 feet above the ground with an initial velocity of 80 feet per second. About how long will it take the baseball to hit the ground? $= 0$

    (handwritten: $0 = 4t^2 - 20t - 1$ or poly-solv)

    A. 2 secs   B. 3 secs   C. 4 secs   D. 5 secs *(circled)*   *(handwritten: $t = \frac{-(-20) \pm \sqrt{(20)^2 - 4(4)(-1)}}{2(4)}$)*

15. A café's annual income depends on x, the number of customers. The function $I(x) = 4x^2 - 20x$ describes the café's total annual income. The function $C(x) = 2x^2 + 5$ describes the total amount the café spends in a year. The café's annual profit, $P(x)$, is the difference between the annual income and the amount spent in a year.

    (handwritten: $P(x) = I(x) - C(x)$)

    Which function describes $P(x)$?

    (handwritten: $P(x) = (4x^2 - 20x) - (2x^2 + 5) = 4x^2 - 20x - 2x^2 - 5$)
    (handwritten: $= 2x^2 - 20x - 5$)

    A. $P(x) = 2x^2 - 20x - 5$ *(circled)*   C. $P(x) = 6x^2 - 20x + 5$

    B. $P(x) = 4x^3 - 20x^2$ D. $P(x) = 8x^4 - 40x^3 - 20x^2 - 100x$

16. Which statement BEST descries the graph of f(x+6)?

$a f(x-h) + k$

   A. The graph of f(x) is shifted up 6 units.
   B. The graph of f(x) is shifted left 6 units.
   C. The graph of f(x) is shifted right 6 units.
   D. The graph of f(x) is shifted down 6 units.

17. Which of these is an even function?

   A. $f(x) = 5x^2 - x^1$ C. $f(x) = 6x^2 - 8x^0$

   B. $f(x) = 3x^3 + x^1$ D. $f(x) = 4x^3 + 2x^2$

18. Which statement BEST describes how the graph of $g(x) = -3x^2$ compares to the graph of $f(x) = x^2$?

$a(x-h)^2 + k$

   A. The graph of g(x) is a vertical stretch of f(x) by a factor of 3.
   B. The graph of g(x) is a reflection of f(x) across the x-axis.
   C. The graph of g(x) is a vertical shrink of f(x) by a factor of 1/3 and a reflection across the x-axis.
   D. The graph of g(x) is a vertical stretch of f(x) by a factor of 3 and a reflection across the x-axis.

19. A flying disk is thrown into the air from a height of 25 feet at time t = 0. The function that models this situation is h(t) = -16t² + 75t + 25, where t is measured in seconds and h is the height in feet. What values of t best describe the time when the disk is flying in the air?

x	f(x)
-2	15
-1	9
0	5
1	3
2	3

   A. 0 < t < 5
   B. 0 < t < 25
   C. All real numbers
   D. All positive integers

$0 = -16t^2 + 75t + 25$

$t = \dfrac{-(75) \pm \sqrt{(75)^2 - 4(-16)(25)}}{2(-16)}$

or poly - solv

$t = -\frac{5}{16}, 5$

20. Use the table to answer the question.

    What is the average rate of change of x over the interval -2 ≤ x ≤ 0?

$\dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{5 - 15}{0 - (-2)} = \dfrac{-10}{2} = -5$

   A. -10
   B. -5
   C. 5
   D. 10

21. What is the end behavior of the graph of $f(x) = -0.25x^2 - 2x + 1$?

   A. As x increases, f(x) increases. As x decreases, f(x) decreases.
   B. As x increases, f(x) decreases. As x decreases, f(x) decreases.
   C. As x increases, f(x) increases. As x decreases, f(x) increases.
   D. As x increases, f(x) decreases. As x decreases, f(x) increases.

22. Use the graph to answer the question.

Which function is shown in the graph?

Ⓐ $f(x) = x^2 - 3x - 10$
B. $f(x) = x^2 + 3x - 10$
C. $f(x) = x^2 + x - 12$
D. $f(x) = x^2 - 5x - 8$

Use Table in calculator to check Points on the graph

$f(x)$

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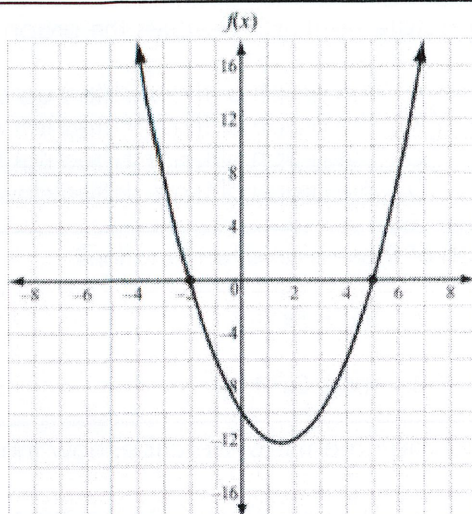
23. The function $f(t) = -16t^2 + 64t + 5$ models the height of a ball that was hit into the air, where t is measured in seconds and h is the height in feet. This table represents the height, g(t), of a second ball that was thrown into the air.

Which statement BEST compares the length of time each ball is in the air?

A. The ball represented by f(t) is in the air for about 5 seconds, and the ball represented by g(t) is in the air for about 3 seconds.
B. The ball represented by f(t) is in the air for about 3 seconds, and the ball represented by g(t) is in the air for about 5 seconds.
C. The ball represented by f(t) is in the air for about 3 seconds, and the ball represented by g(t) is in the air for about 4 seconds.
Ⓓ The ball represented by f(t) is in the air for about 4 seconds, and the ball represented by g(t) is in the air for about 3 seconds.

Time, t (in seconds)	Height, g(t) (in feet)
0	4
1	36
2	36
3	4 ← *almost on the ground*

g(t) about 3 seconds

$f(t) = -16t^2 + 64t + 5$

$0 = -16t^2 + 64t + 5$

$t = \dfrac{-(64) \pm \sqrt{(64)^2 - 4(-16)(5)}}{2(-16)}$

$t = -0.08 , \boxed{4.08}$

$\boxed{f(t) \text{ about 4 seconds}}$