Name_____ Due Date_____

Algebra 2

Summer Math Packet

For Students Entering Honors Algebra 2

Complete the following questions.

1. Which expression represents an irrational number?

A. $-7\sqrt{16}$

B. $\sqrt{200}$

C. $\frac{\sqrt{13}}{\sqrt{13}}$

D. $\sqrt{2+\sqrt{49}}$

2. What is the value of p in the equation below?

$$-\frac{3}{2}\left(16+\frac{4}{9}p\right)=\frac{1}{4}\left(\frac{1}{3}p-6\right)$$

$p =$

3. For which values of a is the expression below a natural number? Check all that apply.

$$a+2\sqrt{28-2a}$$

- ☐ $a = -6$
- ☐ $a = -4$
- ☐ $a = 12$
- ☐ $a = 2$
- ☐ $a = 1$
- ☐ $a = -18$

4. Find the value of the expression below if $a = -\frac{2}{3}$ and $b = \frac{1}{12}$. Give your answer as a fraction in simplest form.

$$\frac{15}{8}a^2+ab$$

5. In the equation $A = p + prt$, which equation can be used to find r?

A. $r=\frac{A-p}{pt}$

B. $r=\frac{A}{pt}-p$

C. $r=\frac{A-pt}{p}$

D. $r=\frac{A}{p}-pt$

6. Which expression represents the expression below written in simplest radical form?

$$\sqrt{48m^9}$$

A. $12m^3\sqrt{2}$

B. $12m^4\sqrt{2m}$

C. $4m^3\sqrt{3}$

D. $4m^4\sqrt{3m}$

7.

Given the function below, find $q(-3)$.

$$q(x) = -x^2 + 15x - 28$$

8.

. Given the function below, if $f(x) = -19$, find $f(-x)$.

$$f(x) = 9 - 4x$$

A. -11
B. 16
C. 23
D. 37

9.

Given the function below, find $f(2c - 3)$.

$$f(x) = x^2 - x$$

A. $4c^2 - 2c - 6$
B. $4c^2 - 2c + 12$
C. $4c^2 - 14c + 6$
D. $4c^2 - 14c + 12$

10.

What are the solutions of the equation below?

$$\frac{c^2}{9} = \frac{c+1}{4}$$

A. $\left\{-\frac{3}{4}, 3\right\}$
B. $\left\{-3, \frac{3}{4}\right\}$
C. $\left\{-\frac{4}{3}, \frac{1}{3}\right\}$
D. $\left\{-\frac{1}{3}, \frac{4}{3}\right\}$

11.

Which two expressions represent the complete factorization of $36x^{10}y^6 - 96x^2y^{18}$?

☐ $6x^2y^6$	☐ $3x^8 - 8y^{12}$
☐ $6x^{10}y^{18}$	☐ $3y^6 - 8x^2$
☐ $12x^2y^6$	☐ $6y^6 - 16x^2$
☐ $12x^{10}y^{18}$	☐ $6x^8 - 16y^{12}$

12.

Which two expressions are the binomial factors of $20x^2 - 7x - 6$?

☐ $(5x - 3)$	☐ $(5x - 6)$	☐ $(4x - 3)$
☐ $(4x + 3)$	☐ $(5x + 2)$	☐ $(10x - 1)$

13.
What are the solutions to the equation below?

$$x^2 - 26x = 60 - x^2$$

A. {-15, 2}
B. {-2, 15}
C. {-10, -3}
D. {-10, 3}

14.
What is the solution set to the equation below?

$$6x^2 + x - 10 = 2x - 8$$

A. $x = \left\{-\frac{1}{2}, \frac{3}{2}\right\}$
B. $x = \left\{-\frac{3}{2}, \frac{1}{2}\right\}$
C. $x = \left\{-\frac{1}{2}, \frac{2}{3}\right\}$
D. $x = \left\{-\frac{2}{3}, \frac{1}{2}\right\}$

15.
Which functions have a zero at $x = -5$?
Check all that apply.

☐ $f(x) = 3x^2 - 75$	☐ $j(x) = 9x + 45$
☐ $g(x) = x^2 - x - 20$	☐ $k(x) = 3x^2 - 11x - 20$
☐ $h(x) = x^2 + 19x + 70$	☐ $p(x) = 2x^2 + 7x - 15$

16.
The sum of three consecutive even integers is 18 more than five-halves the smallest integer. What is the product of the smallest and largest integer?

A. 672
B. 684
C. 698
D. 706

17. Three adjacent angles form a right angle. The measure of the largest is 5 degrees less than 3 times the measure of the smallest angle. The measure of the medium angle is 5 degrees more than the measure of the smallest angle. What is the measure of the largest angle?

A. 45 degrees
B. 46 degrees
C. 49 degrees
D. 51 degrees

18.
Simplify the expression below.

$$\frac{4k^{-8}}{(6k^3)^2} \cdot \frac{k^{-2}}{2k^{-4}}$$

A. $\frac{k^{40}}{10}$ **C.** $\frac{1}{6k^{12}}$

B. $\frac{k^{40}}{18}$ **D.** $\frac{1}{18k^{12}}$

☐

19.
What is the solution to the system of equations?

$$\begin{cases} -3x + 8y = 20 \\ 7x - 5y = -33 \end{cases}$$

(☐ , ☐)

20.
What is the slope of the line of the equation below?

$$2y - 8x = 10$$

A. 4 **C.** $\frac{5}{4}$

B. $-\frac{1}{4}$ **D.** $\frac{1}{4}$

☐

21.
Which quadrant is completely shaded in the graph of $2y - x \leq 10$?

A. Quadrant I
B. Quadrant II
C. Quadrant III
D. Quadrant IV

☐

22.
What is the equation of the axis of symmetry of the graph of the function $f(x) = -x^2 - 4x - 5$?

A. $x = -2$
B. $y = -2$
C. $x = -4$
D. $y = -4$

☐

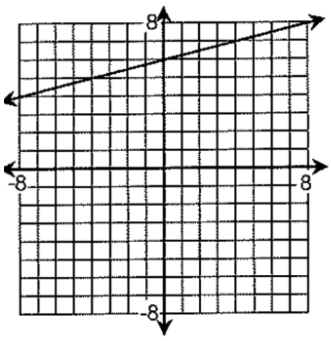
23.
Which statement is true regarding the graph of the function $f(x) = -2x^2 - 4x - 6$?

A. It has a vertex at (1, -4).
B. It has a range of (-6, ∞).
C. It decreases on the interval (-1, ∞).
D. It has a domain of (1, ∞).

☐

24.

. Which equation represents the line graphed?



A. $x + 4y = 24$

B. $4x + y = 6$

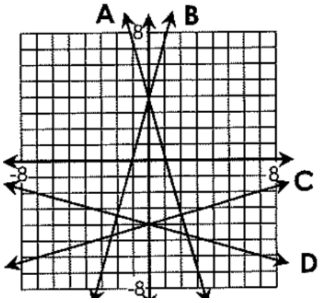
C. $x - 4y = -24$

D. $4x - y = -6$

25.

Which line best represents the equation

$-7x = 8 - 2y$?



A. A

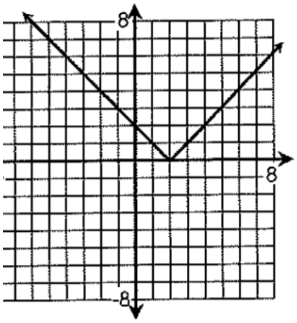
B. B

C. C

D. D

26.

Which equation represents the function graphed below?



A. $f(x) = 2|x|$

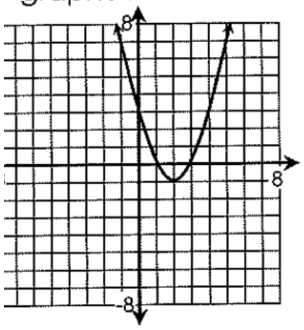
B. $f(x) = |x - 2|$

C. $f(x) = |x + 2|$

D. $f(x) = |x| + 2$

27.

Which equation represents the function graphed below?



A. $f(x) = x^2 - 4x + 3$

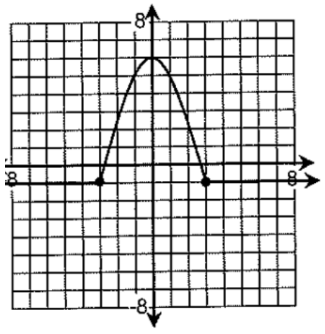
B. $f(x) = x^2 + 4x + 3$

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

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

28.

What is the domain of the function below?



A. $(-\infty, \infty)$

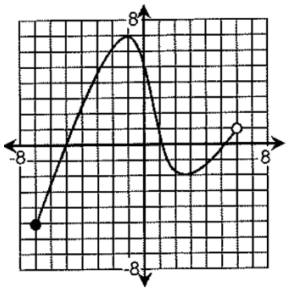
B. [-3, 3]

C. [-1, 6]

D. $(-\infty, 6]$

29.

What is the range of the function below?



A. $-5 \le x \le 7$

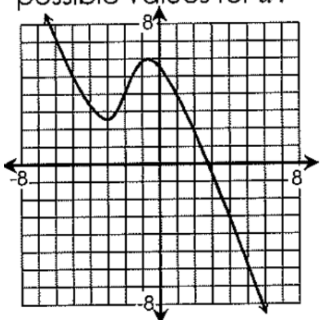
B. $-5 \le y < 1$

C. $-7 \le x < 6$

D. $-5 \le y \le 7$

30.

. If $f(a) = 4$ in the function below, which are possible values for a?



A. -3

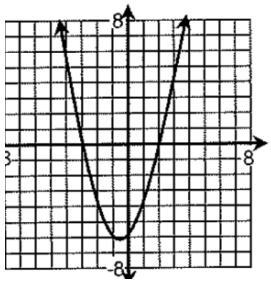
B. {-3, -2}

C. {-2, 1}

D. {-3, -2}

31.

Which two binomials could be placed in the boxes to represent the parabola on the graph in factored form?



$y = (\boxed{?})(\boxed{?})$

- ☐ $(x + 3)$
- ☐ $(x - 3)$
- ☐ $(x + 2)$
- ☐ $(x - 2)$

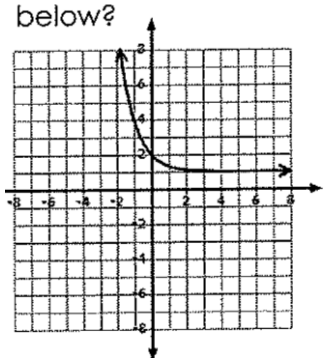
32.

Which statements are true regarding the graph of the equation $f(x) = -(x + 3)^2 + 16$?

- ☐ The axis of symmetry is $x = -3$.
- ☐ The range is $y \geq 16$.
- ☐ The roots are -7 and 1.
- ☐ The roots are -1 and 7.
- ☐ The y-intercept is (0, 7).

33.

Which equation represents the function graphed below?



A. $f(x) = \left(\frac{1}{3}\right)^{x+1}$

B. $f(x) = \left(\frac{1}{3}\right)^{x} + 1$

C. $f(x) = -3^{x+1}$

D. $f(x) = -3^{x} + 1$

34.

The function below has an asymptote located at which line?

$$f(x) = 2^{x+3} - 7$$

A. $x = 3$

B. $x = -3$

C. $y = 7$

D. $y = -7$

35.

The length and width of a rectangle can be expressed as $(x + 9)$ and $(x - 4)$. If the area of the rectangle is 48 square feet, what is the value of x?

$x =$

36.
Ari, Nick, and Carlos sold candy bars for a school fundraiser. Ari sold two less than five times the number of candy bars than Carlos. Nick sold fifteen more than twice the number of candy bars than Carlos. If c is the number of candy bars that Carlos sold, how many more candy bars did Ari sell than Nick?

A. $3c - 17$ **C.** $3c + 17$

B. $3c + 13$ **D.** $3c - 13$

37.
A jar contains a combination of 68 nickels and quarters worth a total of \$11.60. How many quarters are in the jar?

38.
Given three consecutive odd integers, the sum of the smallest integer and twice the largest integer is ten squared more than the median integer. What is the largest integer?

A. 49
B. 51
C. 53
D. 57

39.
The daily profit P made by selling x candy bars is modeled by the function below. How many bars must be sold to maximize profit?

$$P(x) = 7.5x - 0.08x^2$$

A. 41
B. 47
C. 176
D. 188

40.
The function $h(t) = -16t^2 + 140t + 75$ represents the height, h, (in feet) of rocket t seconds after launch. How many seconds will it take after launch for the rocket to reach its maximum height?

A. 3.625 seconds
B. 3.75 seconds
C. 3.875 seconds
D. 4.375 seconds

41.
A rocket is launched from a 100-foot-tall cliff with an initial velocity of 115 ft/s. The function $h(t) = -16t^2 + 115t + 100$ represents the height, h, of the rocket at time t seconds. What is the maximum height of the rocket to the nearest tenth of a foot?

A. 301.5 ft
B. 306.6 ft
C. 310.2 ft
D. 318.8 ft

42.
A diver is standing on a platform 26 feet above a pool. He jumps from the platform with an initial velocity of 9 feet per second. The function $h(t) = -16t^2 + 9t + 26$ represents the height, h, of the diver at time t seconds. To the nearest hundredth of a second, how long will it take the diver to reach the water?

A. 1.53 seconds **C.** 1.59 seconds

B. 1.55 seconds **D.** 1.61 seconds

43.
The function $h(t) = -16t^2 + 60t + 4$ represents the height h, in feet, of a baseball t seconds after it was hit by a batter. Find the length of time the ball was at least 40 feet above the ground.

A. 2 seconds
B. 2.25 seconds
C. 2.5 seconds
D. 2.75 seconds

Course Suggestion → Students are strongly encouraged to have a TI 84- Calculator

Additional Work Space. (Be sure to number your work and keep work legible and organized.)