**Algebra 1 Quick Quiz**
September 19, 2023
Name.....Period.....…

1. Three expressions are shown below.

I. $(x^3)^3$
II. $x^4 \cdot x^5$
III. $x^{10} \cdot x^{-1}$

Which expressions are equivalent for all positive values of $x$?

(1) I and II, only
(2) I and III, only
(3) II and III, only
(4) I, II, and III

2. Jim uses the equation $A = P(1 + 0.05)^t$ to find the amount of money in an account, $A$, of an investment, $P$, after $t$ years. For this equation, which phrase describes the yearly rate of change?

(1) decreasing by 5%
(2) decreasing by 0.05%
(3) increasing by 5%
(4) increasing by 0.05%

3. What are the zeros of $m(x) = x(x^2 - 16)$?

(1) $-4$ and 4, only
(2) $-8$ and 8, only
(3) $-4$, 0, and 4
(4) $-8$, 0, and 8

4. For which function is the value of the $y$-intercept the *smallest*?

(1)

| x | f(x) |
|---|---|
| −4 | 5 |
| −2 | 4 |
| 0 | 3 |
| 2 | 2 |
| 4 | 1 |

(2) $g(x) = |x| + 4$

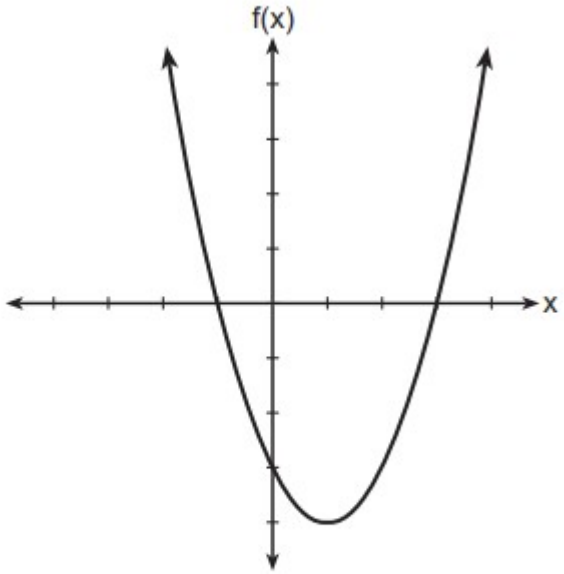
(3)

| x | h(x) |
|---|---|
| −1 | 3 |
| 0 | 2 |
| 1 | 3 |
| 2 | 6 |
| 3 | 11 |

(4) $k(x) = 5^x$

5.

The function $f$ is graphed on the set of axes below.




What is a possible factorization of this function?

(1) $f(x) = (x - 1)(x + 3)$

(2) $f(x) = (x + 1)(x - 3)$

(3) $f(x) = (x + 1)(x - 4)$

(4) $f(x) = (x - 1)(x + 4)$

6.

The range of $f(x) = x^2 + 2x - 5$ is the set of all real numbers

(1) less than or equal to $-6$

(2) greater than or equal to $-6$

(3) less than or equal to $-1$

(4) greater than or equal to $-1$

7.

Tables of values for four functions are shown below.

| x | f(x) |
|---|---|
| 0 | 6 |
| 1 | 7 |
| 2 | 10 |
| 3 | 15 |
| 4 | 22 |

| x | h(x) |
|---|---|
| 0 | 1 |
| 1 | 2 |
| 2 | 4 |
| 3 | 8 |
| 4 | 16 |

| x | g(x) |
|---|---|
| 0 | 0 |
| 1 | −2 |
| 2 | −2 |
| 3 | 0 |
| 4 | 4 |

| x | j(x) |
|---|---|
| 0 | 2 |
| 1 | 5 |
| 2 | 8 |
| 3 | 11 |
| 4 | 14 |

Which table best represents an exponential function?

(1) $f(x)$

(2) $g(x)$

(3) $h(x)$

(4) $j(x)$

8.

If $f(x) = x^2 + 3x$, then which statement is true?

(1) $f(1) = f(-1)$

(2) $f(2) = f(-2)$

(3) $f(1) = f(2)$

(4) $f(-1) = f(-2)$

9.

Jack started a new fitness program. The first day he did 10 push-ups. The program required him to increase the number of push-ups each day by doing 9 less than twice the number from the previous day. Which recursive formula correctly models Jack's new program, where $n$ is the number of days and $a_n$ is the number of push-ups on the $n$th day?

(1) $a_1 = 10$
$a_n = 2a_{n-1} - 9$

(2) $a_1 = 10$
$a_n = 9 - 2a_{n-1}$

(3) $a_1 = 10$
$a_n = 2(n - 1) - 9$

(4) $a_1 = 10$
$a_n = 9 - 2(n - 1)$

10.

Which equation is equivalent to $x^2 - 6x + 4 = 0$?

(1) $(x - 3)^2 = -4$

(2) $(x - 3)^2 = 5$

(3) $(x - 3)^2 = 6$

(4) $(x - 3)^2 = 9$

Bonus

11.

Classify the expression $\frac{2}{\sqrt{144}} + \frac{\sqrt{169}}{3}$ as rational or irrational. Explain your reasoning.