1

$$3x+2y=5$$
$$6x+ny=12$$

In the system of equations above, n is a constant If the system has no solutions, what is the value of n ?

A) 2

B) 4

C) 6

D) 12

2

$$\begin{cases} 2x+15y=18 \\ kx-5y=-7 \end{cases}$$

What is the value of k if the above system of simultaneous equations admits no solutions?

A. $-\frac{1}{3}$

B. -6

C. $-\frac{2}{3}$

D. $\frac{2}{3}$

3

$$3x+7y=14$$
$$ax+28y=56$$

In the system of the equation above, a is a constant. If the system has infinitely many solutions, what is the value of a?

A) 2

B) 3

C) 4

D) 12

4

$$2x+3y=5$$
$$4x+cy=8$$

In the system of equations above, c is a constant. For what value of c will there be no solution (x, y) to the system of equations?

A) 3

B) 4

C) 5

D) 6

5

$$6x-8y=24$$
$$-\frac{2}{3}x+\frac{8}{9}y=m$$

In the system of equations above, m is a constant. If the system has more than one solution, what is the value of m?

A) $-\frac{8}{3}$

B) $-\frac{1}{3}$

C) $\frac{2}{3}$

D) $\frac{8}{3}$

1

$i^2 = -1$
$i^3 = -i$
$i^4 = 1$
$\frac{0}{i}\ \pm 4$

$2 + 3i + 4i^2 + 5i^3 + 6i^4$

If the expression above is equivalent to $a + bi$, where a and b are constants, what is the value of $a + b$? (Note $i = \sqrt{-1}$)

A) 2
B) 6
C) 10
D) 12

2

The expression shown above can be written as the complex number $ai+b$, where a and b are real numbers. What is the value of $a+b$? (Note $i=\sqrt{-1}$)

3

If the expression $\frac{-2i-i^3}{1+3i}$ is written in the form a+bi where a and b are real numbers and $i = \sqrt{-1}$, what is the value of b – a?

4

$i^2 = -1$
$i^3 = -i$
$i^4 = 1$
$\frac{0}{i}\ \pm 4$

In the complex number system, what is the value of the expression $16i^4 - 8i^2 + 4$? (Note: $i = \sqrt{-1}$)

5

Which of the following is equal to $(5 + 2i)(5 - 2i)$? (Note: $i = \sqrt{-1}$)

A) 21
B) 29
C) $21 - 20i$
D) $29 + 20i$

6

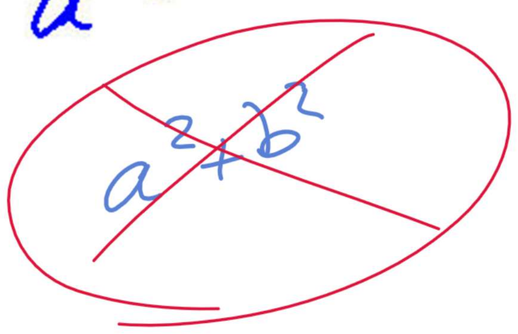
For $i = \sqrt{-1}$, which of the following is equivalent to $\frac{2i-3}{i-5}$?

A. $\frac{13-7i}{24}$
B. $\frac{13-13i}{24}$
C. $\frac{17-7i}{26}$
D. $\frac{17-13i}{24}$

$(a+b)^2 = a^2 + 2ab + b^2$

$(a-b)^2 = a^2 - 2ab + b^2$

$a^2 - b^2 = (a-b)(a+b)$



$a^2 - b^2 = 20$, $a - b = 5$

$a + b = \ldots\ldots\ldots$

$(a-b)(a+b) = 20$

$5(a+b) = \frac{20}{5}$

$a + b = 4$

1

$4x^2 - 9 = (px + t)(px - t)$

In the equation above, p and t are constants. Which of the following could be the value of p?

A) 2

B) 3

C) 4

D) 9

2

If $a^2 + b^2 = 20$ and $ab = 8$, then what is $(b - a)^2$?

(Grid in)

3

If $a^2 - b^2 = 21$ and $a - b = 3$, what is the value of $a + b$?

4

$4x^5 - 16x^3y^2 + 16xy^4$

Which of the following is equivalent to the expression shown above?

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

B. $x^2(2x^2 - 2y^2)^2$

C. $x(2x^2 - 4y^2)^2$

D. $x(4x^2 - 4y^2)^2$

IF $f(x) = 2x + 1$

$g(x) = x^2$

Find:

$F(g(2))$

$g(2) = (2)^2 = 4$

$f(4) = 2(4) + 1 = 9$

$g(F(2))$

$f(2) = 2(2) + 1 = 5$

$g(5) = (5)^2 = 25$

$(F \circ g)(x)$

$f(g(x)) = 2g + 1$

$= 2x^2 + 1$

$f(x) = 2x + 1$

$g(x) = x^2$

$(g \circ f)(x)$

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

$= (2x + 1)^2$

7

The graph of a polynomial equation in the xy-plane contains the points (-1, 0), (2, 0), and (3, 0). Which of the following could be the equation of the graph?

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

B) $y = (x - 1)(x + 2)(x + 3)$

C) $y = x(x - 1)(x - 2)(x + 3)$

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

$x^2 + 5x + 6$

$(x + 2)(x + 3)$

$x = -2, \quad x = -3$

8

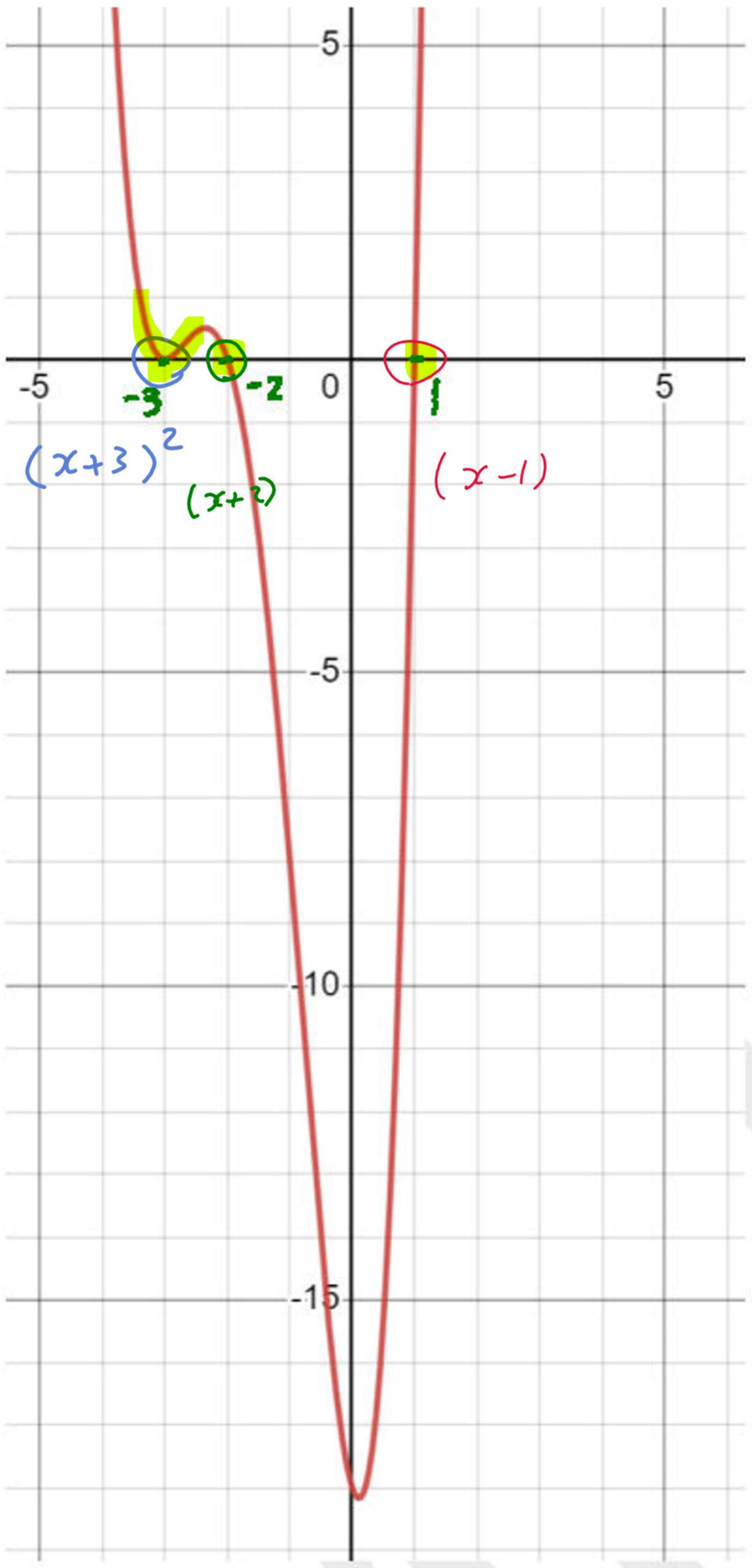
The points $(-3, 0)$, $(1, 0)$, and $(2, 0)$ all lie in the xy-plane on the graph of the polynomial function f. Which of the following could define f?

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

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

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

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


5
-5
0
5
-3
-2
1
(x+3)²
(x+2)
(x-1)
-5
-10
-15