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## **Product Version**

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# Latest Version: 6.0

## Question: 1

Given the functions,  $f(x) = 3x + 6$  and  $g(x) = 2x - 8$ , what is the solution of the equation,  $f(x) = g(x)$ ?

- A.  $x = -12$
- B.  $x = -8$
- C.  $x = -14$
- D.  $x = -10$

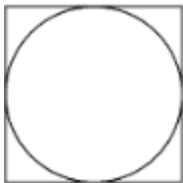
**Answer: C**

Explanation:

The solution of  $f(x) = g(x)$  can be determined by setting the two functions equal to one another. Thus, the following may be written  $3x + 6 = 2x - 8$ . Solving for  $x$  gives  $x = -14$

## Question: 2

Suppose the area of the square in the diagram to the right is  $64 \text{ in}^2$ . (The square is not shown actual size.) What is the area of the circle?



- A.  $16\pi \text{ in}^2$
- B.  $64\pi \text{ in}^2$
- C.  $\frac{64}{\pi} \text{ in}^2$
- D.  $(64 + \pi) \text{ in}^2$

**Answer: A**

Explanation:

The area of a square is equal to the square of the length of one side. If the area is  $64 \text{ in}^2$ , the side length must therefore be  $\sqrt{64 \text{ in}^2} = 8 \text{ in}$ . The circle is inscribed in the square, so the side length of the square is the same as the circle's diameter. If the circle's diameter is  $8 \text{ in}$ , then the circle's radius must be half of that, or  $4 \text{ in}$ . The area of a circle is equal to  $A = \pi r^2 = \pi(4 \text{ in})^2 = 16\pi \text{ in}^2$ .

### Question: 3

Solve for  $x$  in the following inequality:  $4x + 23 > -3x - 6$

- A.  $x > -4.14$
- B.  $x < -4.14$
- C.  $x > 4.14$
- D.  $x < 4.14$

**Answer: A**

Explanation:

A: First, bring the  $-3x$  to the left side of the equation and the 23 to the right side of the equation to make it easier to solve:

$$\begin{aligned}4x + 23 &> -3x - 6 \\4x + 3x &> -6 - 23 \\7x &> -29\end{aligned}$$

Then, divide both side by 7 to solve for  $x$ :

$$\begin{aligned}7x/7 &> -29/7 \\x &> -4.14\end{aligned}$$

### Question: 4

If  $2x + 5x = 3x + x + 30$ , what is the value of  $x$ ?

- A. 2.72
- B. 4.29
- C. 6
- D. 10

**Answer: D**

Explanation:

First, bring all of the terms containing  $x$  to the left side of the equation to make it easier to solve:

$$\begin{aligned}2x + 5x &= 3x + x + 30 \\2x + 5x - 3x - x &= 30 \\7x - 4x &= 30 \\3x &= 30\end{aligned}$$

Then, divide both sides by 3 to solve for  $x$ :

$$\begin{aligned}3x/3 &= 30/3 \\x &= 10\end{aligned}$$

### Question: 5

What is the value of  $3x^2y + y/2 - 6x$ , if  $x = 4$  and  $y = 10$ ?

- A. 221
- B. 461
- C. 872
- D. 1916

**Answer: B**

Explanation:

First, substitute the given values into the expression and then follow the order of operations to simplify:

$$\begin{aligned} 3x^2y + y/2 - 6x &= 3 \times 4^2 \times 10 + 10/2 - 6 \times 4 && \text{Exponents} \\ &= 3 \times 16 \times 10 + 10/2 - 6 \times 4 && \text{Multiplication and Division} \\ &= 480 + 5 - 24 && \text{Addition and Subtraction} \\ &= 461 \end{aligned}$$

### Question: 6

At a school carnival, three students spend an average of \$10. Six other students spend an average of \$4. What is the average amount of money spent by all nine students?

- A. \$5
- B. \$6
- C. \$7
- D. \$8

**Answer: B**

Explanation:

The average is the total amount spent divided by the number of students. The first three students spend an average of \$10, so the total amount they spend is  $3 \times \$10 = \$30$ . The other six students spend an average of \$4, so the total amount they spend is  $6 \times \$4 = \$24$ . The total amount spent by all nine students is  $\$30 + \$24 = \$54$ , and the average amount they spend is  $\$54 \div 9 = \$6$ .

### Question: 7

If  $w = 7$ , calculate the value of the following expression:  $8w^2 - 12w + (4w - 5) + 6$

- A. 279
- B. 285
- C. 337
- D. 505

**Answer: C**

Explanation:

First, substitute the given value of  $w$  into the expression each time it appears. Then, follow the order of operations to find the result:

$$\begin{aligned}8w^2 - 12w + (4w - 5) + 6 &= 8 \times 7^2 - 12(7) + (4 \times 7 - 5) + 6 \\&= 8 \times 7^2 - 12(7) + (23) + 6 \\&= 8 \times 49 - 84 + 23 + 6 \\&= 392 - 84 + 23 + 6 \\&= 337\end{aligned}$$

### Question: 8

If  $x/3 + 7 = 35$ , what is the value of  $x$ ?

- A. 9.33
- B. 14
- C. 84
- D. 126

**Answer: C**

Explanation:

First subtract 7 from both sides to isolate  $x$ :

$$\begin{aligned}\frac{x}{3} + 7 &= 35 \\ \frac{x}{3} + 7 - 7 &= 35 - 7 \\ \frac{x}{3} &= 28\end{aligned}$$

Then, multiply both sides by three to solve for  $x$ :

$$\begin{aligned}\frac{x}{3} \times 3 &= 28 \times 3 \\ x &= 84\end{aligned}$$

### Question: 9

In the following equation, solve for  $x$  by factoring:  $2x^2 - 7x = x^2 - 12$

- A.  $x = -3, -4$
- B.  $x = 3, 4$
- C.  $x = 3, -4$
- D.  $x = -3, 4$

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**Answer: B**

Explanation:

First bring all terms to the left side of the equation and combine like terms to make it easier to factor:

$$\begin{aligned}2x^2 - 7x - x^2 + 12 &= 0 \\x^2 - 7x + 12 &= 0 \\(x - 3)(x - 4) &= 0\end{aligned}$$

Finally, solve for  $x$  in both instances:

$$\begin{aligned}x - 3 &= 0 \\x &= 3\end{aligned}$$

$$x = 3, 4$$

$$\begin{aligned}x - 4 &= 0 \\x &= 4\end{aligned}$$

### Question: 10

If  $x$  is 25% of 250, what is the value of  $x$ ?

- A. 62.5
- B. 100
- C. 1000
- D. 6250

**Answer: A**

Explanation:

Another way of expressing the fact that  $x$  is 25% of 250 is:  $x = (0.25)250$

Then, it is simply a matter of multiplying out the right side of the equation:  $x = 62.5$

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