

# GED

*GED-Mathematical-Reasoning*  
*GEDMathematical Reasoning Certification Exam*

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## Question: 1

A rectangle is twice as long as it is wide. If it were 3 inches shorter and 3 inches wider, it would be square. What is the width in inches of the rectangle?

- A. 4
- B. 6
- C. 8
- D. 12

**Answer: B**

Explanation:

If  $x$  represents the width of the shape, its length is equal to  $2x$ . Since we are told it would be a square if it were 3 inches shorter and 3 inches wider, and the sides of a square are equal, we can use the following equation to solve for  $x$ .

$$\begin{aligned}2x - 3 &= x + 3 \\x - 3 &= 3 \\x &= 6\end{aligned}$$

So, the shape is 6 inches wide.

## Question: 2

The equation below calculates the growth of an apple tree, where  $h$  is the height in feet and  $y$  is the number of years since the tree was planted. How many inches does the tree grow each year?

$$h = 2.5 + 0.75y$$

- A. 0.75
- B. 2.5
- C. 9
- D. 30

**Answer: C**

Explanation:

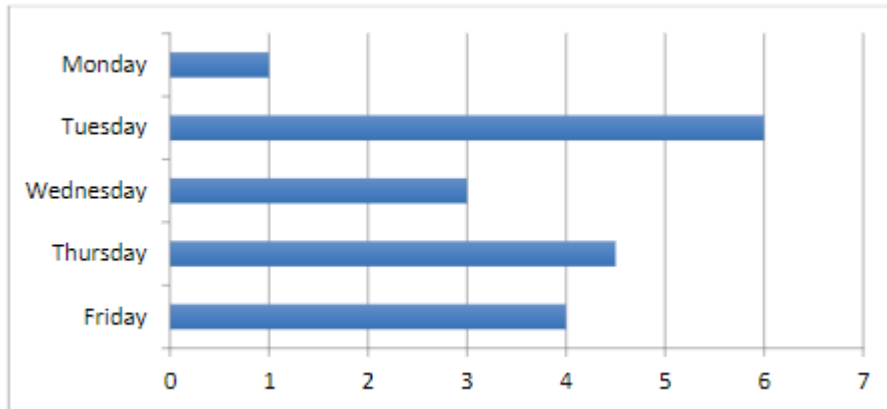
The equation can be translated:

Height = (original height when planted) + 0.75(number of years since planted)

In other words, it grows 0.75 feet every year. The question asks for the number of inches, so we multiply 0.75 by 12 to obtain 9 inches per year.

### Question: 3

The graph below shows the number of miles Jen runs each day, Monday through Friday. What fraction of the time does she run at least four miles?



- A.  $\frac{3}{7}$
- B.  $\frac{3}{2}$
- C.  $\frac{2}{5}$
- D.  $\frac{3}{5}$

**Answer: D**

Explanation:

The graph shows five days that Jen runs. On three of the days (Tuesday, Thursday, and Friday), she runs four or more miles. So three out of five days, or  $\frac{3}{5}$  of the time, she runs at least four miles.

### Question: 4

Simplify the following:  $\frac{x^2}{y^2} + \frac{x}{y^3}$

- A.  $\frac{x^3+x}{y^6}$
- B.  $\frac{x^2+xy}{y^3}$
- C.  $\frac{x^2y+xy}{y^3}$
- D.  $\frac{x^2y+x}{y^3}$

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**Answer: D**

Explanation:

To add the two fractions, first rewrite them with the least common denominator, which is in this case  $y^3$ . This is already the denominator in  $\frac{x}{y^3}$ , and we can rewrite  $\frac{x^2}{y^2}$  as  $\frac{x^2 \times y}{y^2 \times y} = \frac{x^2 y}{y^3}$ . Thus,  $\frac{x^2}{y^2} + \frac{x}{y^3} = \frac{x^2 y}{y^3} + \frac{x}{y^3} = \frac{x^2 y + x}{y^3}$ .

### Question: 5

A man invested \$150 in the stock market. During the first week, he lost \$45. During the second week, he tripled his money. How much does he have at the end of the second week?

- A. \$105
- B. \$210
- C. \$315
- D. \$420

**Answer: C**

Explanation:

First, calculate how much he had at the end of the first week by subtracting \$45 from the amount he invested.

$$\$150 - \$45 = \$105$$

Since he tripled his money the second week, this value by 3.

$$\$105 \times 3 = \$315$$

The man has \$315 at the end of the second week.

### Question: 6

What is the area of a square inscribed in a circle of radius  $r$ ?

- A.  $2r^2$
- B.  $2r^3$
- C.  $2\pi r$
- D.  $4r^2$

**Answer: A**

Explanation:

The diagonal of the square corresponds to the diameter of the circle. This allows for calculation of the side  $a$  by the Pythagorean theorem, where the diameter is  $d = 2r$ .

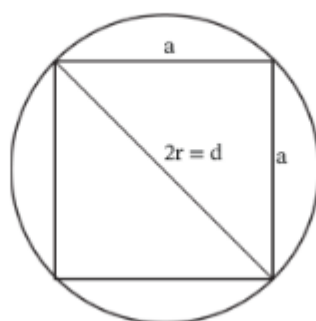
$$d^2 = a^2 + a^2$$

$$(2r)^2 = 2a^2$$

$$4r^2 = 2a^2$$

$$2r^2 = a^2$$

Since the area of the square is  $a^2$ , we can say the area of a square inscribed within a circle is  $2r^2$ .



### Question: 7

Determine the volume of a rectangular box with a length of 5 inches, a height of 7 inches, and a width of 9 inches.

- A.  $445 \text{ in}^3$
- B.  $315 \text{ in}^3$
- C.  $45 \text{ in}^3$
- D.  $35 \text{ in}^3$

**Answer: B**

Explanation:

The volume of a rectangular box can be determined using the formula  $V = l \times w \times h$ , where  $l$  is the length of the box,  $w$  is the width of the box, and  $h$  is the height of the box. Therefore, the volume of the box described in this question is equal to  $5 \times 7 \times 9$ , or  $315 \text{ in}^3$ .

### Question: 8

Expand the following:  $9x(3x^2 + 2x - 9)$

- A.  $27x^2 + 18x - 81$
- B.  $27x^3 + 18x^2 - 81x$
- C.  $12x^3 + 11x^2 - x$
- D.  $27x^3 + 18x^2 - 18x$

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**Answer: B**

Explanation:

To simplify, multiply the value outside of the parentheses by each value inside of the parentheses.

$$\begin{aligned} 9x(3x^2 + 2x - 9) &= 9x(3x^2) + 9x(2x) + 9x(-9) \\ &= 27x^3 + 18x^2 - 81x \end{aligned}$$

### Question: 9

What is the average of  $\frac{7}{5}$  and 1.4?

- A. 1.4
- B. 2.8
- C. 4.2
- D. 7.4

**Answer: A**

Explanation:

The value of the fraction  $\frac{7}{5}$  can be evaluated by dividing 7 by 5, which yields 1.4. The average of 1.4 and 1.4 is  $\frac{1.4+1.4}{2} = 1.4$ .

### Question: 10

An airplane leaves Atlanta at 2 PM and flies north at 250 miles per hour. A second airplane leaves Atlanta 30 minutes later and flies north at 280 miles per hour. At what time will the second airplane overtake the first?

- A. 6:00 PM
- B. 6:20 PM
- C. 6:40 PM
- D. 6:50 PM

**Answer: C**

Explanation:

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Define the variable  $t$  as the elapsed time (in minutes) from the time the first airplane takes off. Then, at any time, the distance traveled by the first plane is  $d_1 = 250t$ . The second plane takes off 30 minutes later so that at any time, the distance that it has traveled is  $d_2 = 280(t - 30)$ . This plane will overtake the first when the two distances are equal, which is when  $d_1 = d_2$ , or when  $250t = 280(t - 30)$ . First, use the distributive property to get rid of the parentheses.

$$250t = 280t - 8,400$$

Next, subtract  $280t$  from each side of the equation.

$$-30t = -8,400$$

Next, divide both sides by  $-30$ .

$$t = 280$$

This gives the value of  $t$  in minutes. Convert to hours by dividing 280 by 60 minutes per hour, which yields an elapsed time of 4.67 hours, or 4 hours and 40 minutes. Since the first plane left at 2 PM, 4 hours and 40 minutes later is 6:40 PM.

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