

# College Admission TSI-Math

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# Latest Version: 6.0

## Question: 1

Michaela can finish 3 problems in 10 minutes. How many problems can she complete in 3 hours?

- A. 90
- B. 54
- C. 18
- D. 9

**Answer: B**

Explanation:

We need to find how many problems Michaela can finish in 3 hours, so we start with converting the 3 hours to minutes. Because 1 hour is 60 minutes, 3 hours is  $3 \times 60 = 180$  minutes. We can set up a ratio:  $\frac{3 \text{ problems}}{10 \text{ minutes}} = \frac{x \text{ problems}}{180 \text{ minutes}}$ . To solve for  $x$ , we cross-multiply and divide:  $10x = 3(180)$ , so  $x = \frac{3(180)}{10} = 54$ . Therefore, Michaela can complete 54 problems in 3 hours.

## Question: 2

If 120 customers purchased coffee today, and this is  $\frac{1}{4}$  less than yesterday, how many people purchased coffee yesterday?

- A. 90
- B. 150
- C. 160
- D. 240

**Answer: C**

Explanation:

If 120 is  $\frac{1}{4}$  less than yesterday's number, we can write this as:  $120 = y - \frac{1}{4}y$ , where  $y$  is yesterday's number. We combine terms on the right to solve:  $120 = \frac{3}{4}y$ , so  $y = 120 \left(\frac{4}{3}\right) = 160$ . Therefore, 160 people purchased coffee yesterday.

## Question: 3

If  $\frac{3}{s} = 7$  and  $\frac{4}{t} = 12$ , then what is the value of  $s - t$ ?

- A.  $-\frac{1}{7}$
- B.  $\frac{2}{7}$
- C.  $\frac{2}{12}$
- D.  $\frac{2}{21}$

- A. Option A
- B. Option B
- C. Option C
- D. Option D

**Answer: D**

Explanation:

Multiply both sides of the first equation by  $s$  to get  $3 = 7s$ . Then divide both sides by 7 to find that  $s = \frac{3}{7}$ . Multiply both sides of the second equation by  $t$  to get  $4 = 12t$ . Then divide both sides by 12 to find that  $t = \frac{4}{12}$ , which reduces to  $\frac{1}{3}$ . To find the difference, we must convert to a common denominator. In this case, the common denominator is 21. Multiplying by appropriate fractional equivalents of 1, we find that  $\frac{3}{7} \left( \frac{3}{3} \right) = \frac{9}{21}$  and  $\frac{1}{3} \left( \frac{7}{7} \right) = \frac{7}{21}$ . Therefore,  $s - t = \frac{9}{21} - \frac{7}{21} = \frac{2}{21}$ .

### Question: 4

If the average of 7 and  $x$  is equal to the average of 9, 4, and  $x$ , what is the value of  $x$ ?

- A.  $x = 4$
- B.  $x = 5$
- C.  $x = 6$
- D.  $x = 7$

**Answer: B**

Explanation:

The average of 7 and  $x$  is  $\frac{7+x}{2}$ . The average of 9, 4, and  $x$  is  $\frac{9+4+x}{3}$ .

$$\frac{7+x}{2} = \frac{13+x}{3}$$

To solve, start by cross-multiplying.

$$3(7+x) = 2(13+x)$$

Then, distribute and solve for  $x$ .

$$21 + 3x = 26 + 2x$$

$$3x = 5 + 2x$$

$$x = 5$$

### Question: 5

If a number is increased by 30% and then decreased by 25%, how does the final number differ from the original?

- A. It is 5% greater than the original.
- B. It is 7.5% greater than the original.
- C. It is the same as the original.
- D. It is 2.5% less than the original.

**Answer: D**

Explanation:

We can choose a value for the original number and calculate the increase and decrease. For example, we can let the original value equal 100. We increase this by 30% by multiplying by 1.3:  $100(1.3) = 130$ . Then we decrease it by 25% by multiplying by 0.75:  $130(0.75) = 97.5$ . This is 2.5 less than 100, and 2.5 out of 100 is 2.5%, so the final value is 2.5% less than the original.

### Question: 6

Abram rolls a 6-sided die with each side labeled 1-6. What is the probability he rolls an even number or a number greater than 4?

- A.  $\frac{1}{6}$
- B.  $\frac{2}{3}$
- C.  $\frac{3}{4}$
- D.  $\frac{5}{6}$

- A. Option A
- B. Option B
- C. Option C
- D. Option D

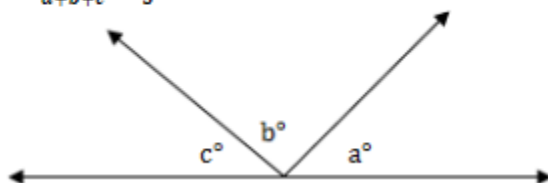
**Answer: B**

Explanation:

The probability of non-mutually exclusive events  $A$  and  $B$  occurring may be written as  $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ . There are 3 even numbers on the die, so the probability of rolling an even number is  $\frac{3}{6}$ . There are 2 numbers greater than 4, so this probability is  $\frac{2}{6}$ . There is 1 number, 6, that is both even and greater than 4, so this probability is  $\frac{1}{6}$ . Thus,  $P(A \text{ or } B) = \frac{3}{6} + \frac{2}{6} - \frac{1}{6} = \frac{4}{6} = \frac{2}{3}$ .

### Question: 7

In the following figure, if  $\frac{b}{a+b+c} = \frac{3}{5}$ , then what is the value of  $b$ ?



- A. 60
- B. 72
- C. 108
- D. 120

**Answer: C**

Explanation:

The angles  $a$ ,  $b$ , and  $c$  form a straight line, so  $a + b + c = 180$ . Substituting 180 for  $a + b + c$  in the proportion, we have  $\frac{b}{180} = \frac{3}{5}$ . By cross-multiplying, we can solve for  $b$ .

$$5b = 3(180)$$

$$b = 108$$

### Question: 8

A communications company charges \$5.00 for the first 10 minutes of a call and \$1.20 for each minute thereafter. Which of the following equations correctly relates the price in dollars,  $d$ , to the number of minutes,  $m$  (when  $m \geq 10$ )?

- A.  $d = 5 + 1.2m$
- B.  $d = 5 + 1.2(m - 10)$
- C.  $d = 5m + 1.2(m + 10)$
- D.  $d = (m + 10)(5 + 1.2)$

A. Option A

- B. Option B
- C. Option C
- D. Option D

**Answer: B**

Explanation:

The charge is \$1.20 for each minute after the first ten minutes. The number of minutes after the first ten minutes is  $m - 10$ , so \$1.20 per minute charged for the part of the phone call exceeding 10 minutes is  $1.2(m - 10)$ . Adding this to the \$5.00 charge for the first ten minutes gives  $d = 5 + 1.2(m - 10)$ .

### Question: 9

If an item with an original price of \$25.98 is marked down by 25%, and a coupon for 20% off is additionally applied, what is the final price?

- A. \$19.49
- B. \$17.77
- C. \$15.59
- D. \$13.28

**Answer: C**

Explanation:

An item is first marked down by 25% and then by an additional 20%. If 25% is taken off the price, the remaining cost is 75% of the original price, so we can calculate the first markdown:  $25.98(0.75) = 19.485$ . If 20% is taken off this price, the remaining cost is 80% of this price, so we can calculate the second and final markdown:  $19.485(0.8) = 15.588$ . We round to the hundredths place to find the final cost: \$15.59.

### Question: 10

If the ratio of the measures of the three angles in a triangle are 2 : 6 : 10, what is the actual measure of the smallest angle?

- A. 20 degrees
- B. 40 degrees
- C. 60 degrees
- D. 80 degrees

**Answer: A**

Explanation:

The sum of the measures of the three angles of any triangle is 180 degrees. The equation for the sum of the angles of this triangle can be written as  $2x + 6x + 10x = 180$ , or  $18x = 180$ . Therefore,  $x = 10$ . We multiply 2 by 10 to find that the measure of the smallest angle is 20 degrees.

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