

**Directions:** Please choose the best answer choice for each of the following questions.

1. The formula  $D = \frac{m}{V}$  is used to calculate the density,  $D$ , of an object with mass,  $m$ , and volume,  $V$ . If an object has the same mass but half the volume, what is the effect on the density?
- A. The density is increased by 2.
  - B. The density is divided by 2.
  - C. The density is the same.
  - D. The density is doubled.

**Answer Choice Rationale**

- A. This answer mistakes the density as increasing by 2 instead of increasing by a factor of 2.
- B. This answer mistakes the density as decreasing instead of increasing.  
If the volume decreases, the density must also change since the mass will be divided by a smaller number to give the density.
- C. Correct answer.

ItemID A2K.1021102  
Correct D  
Standard(s) MA.9-12.MA.912.A.3.3

2. The pressure and volume of a certain gas are related by the equation  $pv = 24$ , where  $p$  = pressure in pascals and  $v$  = volume in cubic meters. If the value of  $p$  is doubled, what happens to the value of  $v$ ?
- A. It is multiplied by 4.
  - B. It is multiplied by 2.
  - C. It is divided by 4.
  - D. It is divided by 2.

**Answer Choice Rationale**

- A. This answer mistakes the factor as 4 instead of 2, and mistakes the value of  $v$  as increasing instead of decreasing.
- B. This answer mistakes the value of  $v$  as doubling instead of halving.
- C. This answer mistakes the value of  $v$  as decreasing by a factor of 4 instead of 2.
- D. Correct answer.

ItemID A2K.1021116  
Correct D  
Standard(s) MA.9-12.MA.912.A.3.3

3. Which of the following shows the equation below correctly solved for  $x$ ?  
 $8x = 5x + 3y + z$
- A.  $x = y + z$
  - B.  $x = 3y + z$
  - C.  $x = (y/3) + (z/3)$
  - D.  $x = y + (z/3)$

**Answer Choice Rationale**

- A. No rationale available
- B. No rationale available
- C. No rationale available
- D. Correct

ItemID saltsmad.2688  
Correct D  
Standard(s) MA.9-12.MA.912.A.3.3

4. Which equation could be used to convert the number of quarters,  $q$ , to the number of dollars,  $d$ ?
- A.  $d = 25q$
  - B.  $d = 4q$
  - C.  $d = 0.25q$
  - D.  $d = \frac{1}{25}q$

**Answer Choice Rationale**

- A. No rationale available
- B. No rationale available
- C. Correct
- D. No rationale available

ItemID A2KC.1223947  
Correct C  
Standard(s) MA.9-12.MA.912.A.3.3

5. Which correctly solves the following equation for the variable 'd' ?  
 $r=d/t$
- A.  $d=r/t$
  - B.  $d=r*t$
  - C.  $d=t/r$
  - D.  $r=d*t$

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**Answer Choice Rationale**

- A. No rationale available
- B. Correct
- C. No rationale available
- D. No rationale available

ItemID saltsmad.2685  
 Correct B  
 Standard(s) MA.9-12.MA.912.A.3.3

6. Karen wants Gustavo's Restaurant to cater her next party. She plans to invite more than 50 people. Gustavo's charges \$12 for each of the first 50 people and \$9 for each additional person. Gustavo's also charges a fixed setup and cleaning fee of \$125. If  $x$  represents the number of people attending Karen's party, which expression can be used to determine Karen's catering cost?
- A.  $\$125 + \$12(50) + \$9(x - 50)$
  - B.  $\$125 + \$12(50) - \$9(x + 50)$
  - C.  $\$125 + \$12(50) + \$9(50 - x)$
  - D.  $\$125 + \$12(50) - \$9(x - 50)$

**Answer Choice Rationale**

- A. Correct answer.  
 This answer subtracts the cost of the number of guests greater than 50. Instead, this cost should be added. This answer also adds 50 to the number of guests over 50 instead of subtracting the 50 already accounted for in the other part of the expression.
- B. This answer subtracts the number of guests over 50 from the number 50. Instead, 50 should be subtracted from the number of guests over 50.  
 This answer subtracts the cost of the number of guests greater than 50. Instead, this cost should be added to the total cost.

ItemID A2K.1053146  
 Correct A  
 Standard(s) MA.9-12.MA.912.A.3.5

7. Max's grandmother gives him \$12 per hour to mow her lawn. On the way home, he always buys a can of soda for \$1.25 and pays for his bus fare, which is \$1.75. If he deducts these two expenses from his earnings, which equation shows the relationship between his earnings,  $d$ , and the number of hours,  $h$ , he works mowing the lawn?
- A.  $d = 3h$
  - B.  $d = 12h$
  - C.  $d = 3h + 12$
  - D.  $d = 12h - 3$

**Answer Choice Rationale**

- A. Multiplies the bus fare also by the number of hours worked.
- B. Only calculates the hourly earnings.
- C. Adds the bus fare instead of subtracting.
- D. Correct answer.

ItemID A2K.1044943  
 Correct D  
 Standard(s) MA.9-12.MA.912.A.3.5

8. The Ruiz family is budgeting to buy a new house. With their current income, they can pay from \$825 to \$975 per month. If  $x$  represents the monthly payment, which inequality below shows this relationship?
- A.  $\$825 < x < \$975$
  - B.  $\$825 > x > \$975$
  - C.  $\$825 \leq x \leq \$975$
  - D.  $\$825 \geq x \geq \$975$

**Answer Choice Rationale**

- A. This answer uses  $<$  signs instead of  $\leq$  signs.
- B. This answer uses  $>$  signs instead of  $\leq$  signs.
- C. Correct answer.
- D. This answer uses  $\geq$  signs instead of  $\leq$  signs.

ItemID A2K.1009654  
 Correct C  
 Standard(s) MA.9-12.MA.912.A.3.5

9. Jorge is five times his daughter's age,  $x$ , less ten. If Jorge is thirty years old, how old is his daughter?
- A. 4
  - B. 6
  - C. 8
  - D. 16

**Answer Choice Rationale**

- A. No rationale available
- B. No rationale available
- C. Correct
- D. No rationale available

<p>ItemID A2KC.1140860 Correct C Standard(s) MA.9-12.MA.912.A.3.5</p>
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10. A local cell phone company charges a rate of \$5.00 per month for up to 250 text messages. There is a 20-cent charge per message for any sent or received over 250 in one month. What would be the total monthly charge for sending or receiving 341 text messages?
- A. \$6.82
  - B. \$18.20
  - C. \$23.20
  - D. \$73.20

**Answer Choice Rationale**

- A. This option is the result of multiplying by 0.02 instead of by 0.2.
- B. This option is the result of not adding the \$5 charge.
- C. Correct answer
- D. This option is the result of not subtracting the 250 texts from the total before calculating.

<p>ItemID A2K.1140087 Correct C Standard(s) MA.9-12.MA.912.A.3.5</p>
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**Stop! You have finished this exam.**