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Part 1: For questions 1-7, circle the answer that best answers the question.

1. The relation between the three sides of a triangle is shown below.

![Triangle Diagram]

If the perimeter of the triangle is 34.6 cm, what is the length of the longest side of the triangle?

A). 5.1 cm  B). 14.3 cm  C). 15.2 cm  D). 17.24 cm

2. Solve for x.

\[ \frac{2}{3}(2x + 2) - \frac{1}{3} = -11 \]

A). \( x = -\frac{7}{2} \)  B). \( x = -9 \)  C). \( x = -\frac{17}{2} \)  D). \( x = 9 \)

3. Which of the following steps would you use first to solve the following equation?

\[ 6x - 2 = 15 \]

A). Multiply both sides by 2. 
B). Divide both sides by 6. 
C). Add 2 to both sides. 
D). Subtract 2 from both sides.
4. An internet café charges a monthly rate of $5 and $.05 a minute for usage of their computers. Tom’s bill for y minutes is $10. Which equation could you use to find out how many minutes Tom used at the internet café?

A). \(10 = .05y + 5\)  
B). \(10 = 5y + .05\)  
C). \(.05y + 10 = 5\)  
D). \(.05(y+5) = 10\)

5. The formula for finding the distance traveled is \(d= rt\). \(D\) is the distance, \(r\) is the rate (speed), and \(t\) is the time. Solve this formula for \(t\).

A). \(d - r = t\)  
B). \(\frac{d}{r} = t\)  
C). \(\frac{r}{d} = t\)  
D). \(r - d = t\)

6. Solve for \(y\).

\[3y + 2 = 2(y-2) + 4\]

A). \(y = -2\)  
B). \(y = 6\)  
C). \(y = 0\)  
D). \(y = 2\)

7. Which of the following are the solutions to the following equation:

\[2x - 6 + 4 = 16\]

A. \(x = -9\)  
B. \(x = 7\)  
C. \(x = 9\)  
D. \(x = -7\)
Part 2: For questions 8-13, complete each problem and write your answer on the blank.

8. Solve for x.  
   \[ 3(2x - 2) = -45 \]  
   Answer: ________________________________

9. The perimeter of a rectangle is 24.8 cm. The width is 4 cm longer than the length. Find the width of the rectangle.  
   Answer: ________________________________

10. Solve for x.  
    \[ \frac{x}{4} + 6 = \frac{3}{4}x - 2 \]  
    Answer: ________________________________

11. The formula for area of a trapezoid is:  
    \[ A = \frac{1}{2}h(B_1 + B_2) \]  
    where \( h \) is the height, \( B_1 \) is the shorter base and \( B_2 \) is the longer base.  
    The height of a trapezoid is 6 cm, Base 1 is 4 cm and the Area of the trapezoid is 36 \( \text{cm}^2 \). Find the length of Base 2.  
    Answer: ________________________________
12. Solve for $g$:

\[ \frac{f + g}{h} = 9 \]

Answer: _______________________________ 

13. Kelly charges $4.50 an hour for raking leaves. She also charges a $2 fee for bags. How many hours will Kelly need to work on one lawn in order to earn $20?

Answer: _______________________________

Part 3: For questions 14 & 15, answer each question thoroughly. (There are multiple parts to each question).

14. The formula for finding the average of 2 numbers is  

\[ a = \frac{x + y}{2} \]

where

- \( a \) = average
- \( x \ & y \) = the two numbers

• Solve the formula for \( y \).

• If one number, \( x \) is 20 and the average is 49, find the other number \( y \). Justify your answer.
15. Lisa made and sold jewelry for a craft show. She made beaded bracelets, necklaces, and rings. She made 25 more bracelets than rings and three times as many necklaces than rings. She sold all of her jewelry. The prices are show below.

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• Write an expression to represent the number of bracelets sold and an expression to represent the number of necklaces sold. Let x represent the number of rings sold.

• The total sales of Lisa’s jewelry was $228. Write an equation to represent the total sales of Lisa’s jewelry.

• How many bracelets did Lisa sell? Explain how you determined your answer.
Part 1: For questions 1-7, circle the answer that best answers the question. (1 Point each)

1. The relation between the three sides of a triangle is shown below.

If the perimeter of the triangle is 34.6 cm, what is the length of the longest side of the triangle?

A). 5.1 cm  
B). 14.3 cm  
(C). 15.2 cm  
D). 17.24 cm

2. Solve for x.

\[ \frac{2}{3} (2x + 2) - \frac{1}{3} = -11 \]

A). \( x = -\frac{7}{2} \)  
B). \( x = -9 \)  
C). \( x = -\frac{17}{2} \)  
D). \( x = 9 \)

3. Which of the following steps would you use first to solve the following equation?

\[ 6x - 2 = 15 \]

A). Multiply both sides by 2.  
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4. An internet café charges a monthly rate of $5 and $.05 a minute for usage of their computers. Tom’s bill for y minutes is $10. Which equation could you use to find out how many minutes Tom used at the internet café?

A). \(10 = 0.05y + 5\)
B). \(10 = 5y + 0.05\)
C). \(0.05y + 10 = 5\)
D). \(0.05(y+5) = 10\)

5. The formula for finding the distance traveled is \(d = rt\). \(D\) is the distance, \(r\) is the rate (speed), and \(t\) is the time. Solve this formula for \(t\).

\[
\frac{d}{r} = t
\]

A). \(d - r = t\)
B). \(\frac{d}{r} = t\)
C). \(\frac{r}{d} = t\)
D). \(r - d = t\)

6. Solve for \(y\).

\(3y + 2 = 2(y - 2) + 4\)

A). \(y = -2\)
B). \(y = 6\)
C). \(y = 0\)
D). \(y = 2\)
7. Which of the following are the solutions to the following equation:

\[ 2x - 6 + 4 = 16 \]

A. \( x = -9 \)  
B. \( x = 7 \)  
C. \( x = 9 \)  
D. \( x = -7 \)

\[ \begin{align*}
2x - 6 + 4 & = 16 \\
2x - 6 & = 16 \\
2x - 6 + 6 & = 16 + 6 \\
2x & = 18 \\
2x / 2 & = 18 / 2 \\
x & = 9
\end{align*} \]

Part 2: For questions 8-13, complete each problem and write your answer on the blank. (2 Points)

8. Solve for \( x \).

\[ 3(2x - 2) = -45 \]

Answer: \( x = -6.5 \)

\[ \begin{align*}
3(2x - 2) & = -45 \\
6x - 6 & = -45 \\
6x - 6 + 6 & = -45 + 6 \\
6x & = -39 \\
6 & \quad 6 \\
x & = -6.5
\end{align*} \]

9. The perimeter of a rectangle is 24.8 cm. The width is 4 cm longer than the length. Find the width of the rectangle.

Answer: \( 8.2 \) cm

\[ \begin{align*}
2L + 2W & = P \\
P & = 24.8 \\
\text{Length} & = L \\
\text{Width} & = L + 4 \\
2L + 2(L + 4) & = 24.8 \\
2L + 2L + 8 & = 24.8 \\
4L + 8 & = 24.8 \\
4L + 8 - 8 & = 24.8 - 8 \\
4L & = 16.8 \\
4 & \quad 4 \\
L & = 4.2 \text{ cm} \\
\text{Width} & = 4.2 + 4 \\
\text{Width} & = 8.2 \text{ cm}
\end{align*} \]
10. Solve for x.

\[ \frac{x}{4} + 6 = \frac{3}{4}x - 2 \]

Answer: \( x = 16 \)

\[
4\left[\frac{x}{4} + 6\right] = 4\left[\frac{3}{4}x - 2\right] \\
4x + 24 = 3x - 8 \\
x + 24 = 3x - 8 \\
x - x + 24 = 3x - x - 8 \\
24 = 2x - 8 \\
24 + 8 = 2x - 8 + 8 \\
32 = 2x \\
\frac{32}{2} = x \\
16 = x
\]

11. The formula for area of a trapezoid is: \( A = \frac{1}{2}h(B_1 + B_2) \) where \( h \) is the height, \( B_1 \) is the shorter base and \( B_2 \) is the longer base.

The height of a trapezoid is 6 cm, Base 1 is 4 cm and the Area of the trapezoid is 36 cm\(^2\). Find the length of Base 2.

Answer: Base 2 is 8 cm

\[
A = \frac{1}{2}h(B_1 + B_2) \\
36 = \frac{1}{2} \cdot 6(4 + B_1) \\
36 = 3(4 + B) \\
36 = 12 + 3B \\
36 - 12 = 12 - 12 + 3B \\
24 = 3B \\
\frac{24}{3} = B \\
8 = B
\]

12. Solve for g:

\[ \frac{f + g}{h} = 9 \]

Answer: \( g = 9h - f \)

\[
h(f + g) = 9h \\
h \\
f + g = 9h \\
f - f + g = 9h - f \\
g = 9h - f
\]
13. Kelly charges $4.50 an hour for raking leaves. She also charges a $2 fee for bags. How many hours will Kelly need to work on one lawn in order to earn $20?

Answer: Kelly needs to work 4 hours to earn $20.

\[
\begin{align*}
4.5h + 2 &= 20 \\
4.5h + 2 - 2 &= 20 - 2 \\
4.5h &= 18 \\
\frac{4.5}{4.5} &= 4
\end{align*}
\]

Part 3: For questions 14 & 15, answer each question thoroughly. (There are multiple parts to each question). (3 Points Each)

14. The formula for finding the average of 2 numbers is \( a = \frac{x + y}{2} \) where

- **a** = average
- **x & y** = the two numbers

• Solve the formula for **y**.

\[
2a = (x + y) \frac{2}{2} \\
2a = x + y \\
2a - x = x - x + y \\
2a - x = y
\]

• If one number, \( x \) is 20 and the average is 49, find the other number \( y \). Justify your answer.

\[
2a - x = y \\
2(49) - 20 = y \\
78 = y
\]

The other number is 78.

Justify:

\[
a = \frac{x + y}{2}
\]

\[
49 = \frac{20 + 78}{2}
\]

\[
49 = 49
\]
15. Lisa made and sold jewelry for a craft show. She made beaded bracelets, necklaces, and rings. She made 25 more bracelets than rings and three times as many necklaces than rings. She sold all of her jewelry. The prices are show below.

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• Write an expression to represent the number of bracelets sold and an expression to represent the number of necklaces sold. Let x represent the number of rings sold.

Bracelets = x + 25
Necklaces = 3x

• The total sales of Lisa’s jewelry was $228. Write an equation to represent the total sales of Lisa’s jewelry.

2x + 3(x+25) + 4(3x) = 228

• How many bracelets did Lisa sell? Explain how you determined your answer.

2x + 3(x+25) + 4(3x) = 228
2x + 3x + 75 + 12x = 228
2x + 3x + 12x + 75 = 228
17x + 75 = 228
17x + 75 - 75 = 228 - 75
17x = 153

17x = 153
17 17

x = 9

Lisa sold 34 bracelets. I solved the equation and found x to be 9. X represents rings, so 9 rings were sold. Since she sold 25 more bracelets than rings, I added 25 + 9 to get 34. Therefore, Lisa sold 34 bracelets.