

Unit 2: Equations and Inequalities STUDY GUIDE

13. Joe is saving to buy a television that costs \$1150. Joe currently has \$175 saved. He plans to save an additional \$75 each week. How many weeks will it take Joe to have \$1150 saved?

$$\begin{array}{r} 75x + 175 = 1150 \\ -175 \quad -175 \\ \hline 75x = 975 \\ x = 13 \end{array}$$

13 WEEKS

14. The sum of three consecutive even integers is -66. What is the value of the smallest of the three integers? Set up and solve an equation to find your answer.

$$\begin{array}{l} n = 1^{st} \# \\ n + 2 = 2^{nd} \# \\ n + 4 = 3^{rd} \# \end{array} \quad \begin{array}{r} n + n + 2 + n + 4 = -66 \\ 3n + 6 = -66 \\ -6 \quad -6 \\ \hline 3n = -72 \\ \frac{3}{3} \quad \frac{3}{3} \\ n = -24 \end{array}$$

15. What is the solution to the inequality?

$$\begin{array}{r} -4(2x + 3) - 10x > 14(x - 8) + 3x \\ -8x - 12 - 10x > 14x - 112 + 3x \\ -18x - 12 > 17x - 112 \\ +18x \quad +18x \\ \hline -12 > 35x - 112 \end{array}$$

$$\begin{array}{r} 100 > 35x \\ 2.86 > x \end{array}$$

$x < 2.86$

16. Suzie's test scores are 90, 93, 85, 87, and 88. What is the lowest she can score on the next test to achieve an average of at least a 90?

$$\begin{array}{r} 90 + 93 + 85 + 87 + 88 + x \geq 90 \\ \hline 443 + x \geq 540 \\ -443 \quad -443 \\ \hline x \geq 97 \end{array}$$

17. Which of the following equations gives a solution of "no solution?"

- A. $3(x + 3) = 9$
- B. $-2x + 7 = -2x + 14$
- C. $4x + 3 = -4x + 3$
- D. $x - 3 = x - 3$

18. Which of the following equations gives a solution of "all real numbers?"

- A. $3(x + 3) = 9$
- B. $-2x + 7 = -2x + 14$
- C. $4x + 3 = -4x + 3$
- D. $x - 3 = x - 3$

19. Solve:

$$\begin{array}{r} \frac{10}{1} \left(\frac{6}{10}x + \frac{2}{5} \right) = \frac{1}{2}x - \frac{3}{5} \\ \frac{60}{10}x + \frac{20}{5} = \frac{10}{2}x - \frac{30}{5} \\ 6x + 4 = 5x - 6 \\ -5x \quad -5x \\ \hline x + 4 = -6 \\ -4 \quad -4 \\ \hline x = -10 \end{array}$$

$$\begin{array}{r} x + 4 = -6 \\ -4 \quad -4 \\ \hline x = -10 \end{array}$$

20. Translate to an equation and solve to find three consecutive integers whose sum is -54.

$$\begin{array}{l} n = 1^{st} \# \\ n + 1 = 2^{nd} \# \\ n + 2 = 3^{rd} \# \end{array} \quad \begin{array}{r} n + n + 1 + n + 2 = -54 \\ 3n + 3 = -54 \\ -3 \quad -3 \\ \hline 3n = -57 \\ \frac{3}{3} \quad \frac{3}{3} \\ n = -19 \end{array}$$

$$\begin{array}{r} n = -19 \\ n + 1 = -18 \\ n + 2 = -17 \end{array}$$

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21. If the sum of three consecutive odd integers is at most 165, what is the largest of these three integers? Set up and solve equation.

$n = 1^{\text{st}} \#$
 $n+2 = 2^{\text{nd}} \#$
 $n+4 = 3^{\text{rd}} \#$

$n + n + 2 + n + 4 \leq 165$
 $3n + 6 \leq 165$
 $3n \leq 159$
 $n \leq 53$

$n + 4 \leq 54$

22. The length of a rectangle is 3 more than twice its width. Its perimeter is 60ft. Find its dimensions.

Draw or use $P = 2L + 2W$

$2W + 3$

W $P = 60$ W
 ft.

$2W + 3$

$2W + 3 + W + 2W + 3 = 60$
 $5W + 6 = 60$
 $-6 \quad -6$

 $5W = 54$
 $W = 9 \text{ ft.}$

$L = 21 \text{ ft.}$
 $W = 9 \text{ ft.}$

Make sure to label your answers and use the correct units.

23. A. Solve the inequality: $6r - (3r + 2) \geq -35$

B. Name three possible solutions to the inequality.

$6r - 3r - 2 \geq -35$
 $3r - 2 \geq -35$
 $3r \geq -33$
 $r \geq -11$

$-10, -9, -8$

24. The equation below is used to find C, the total cost for printing a quantity of books, b.

$C = 3b + 150$

Write an equivalent equation that is solved for b in terms of C.

$C = 3b + 150$
 $-150 \quad -150$
 $C - 150 = 3b$
 $\frac{C - 150}{3} = b$

25. Solve for h if $A = \frac{1}{2}bh$.

$A = \frac{1}{2}bh$
 $2A = bh$
 $\frac{2A}{b} = h$

26. Solve the following equation for y:

$3x - 4y = 12$
 $-3x \quad -3x$
 $-4y = -3x + 12$
 $\frac{-4y}{-4} = \frac{-3x + 12}{-4}$
 $y = \frac{3}{4}x - 3$

27. The total number of students who could attend a field trip is represented by the variable t. The number of students in Group A is greater than the number of students in Group B. Group A has 3 students more than $\frac{2}{3}$ the total number of students. Group B has 4 less than the total number of students. Write an inequality to represent this situation. DO NOT SOLVE.

GROUP A > GROUP B
 $\frac{2}{3}t + 3 > t - 4$