Name KEY Block _____ Date _____

Unit 1: Expressions, Equations, and Inequalities STUDY GUIDE

1. Which of the following does not result in a solution of $x = 5$? SEE pg. 4 FOR WORK

A. $52 = 4x + 7x - 8 + x$

B. $5 + 2(3x + 4) = 43$

C. $2(4x - 12) + 3x = 6x + 1$

D. $2(4x + 7) = 2x + 4$

2. Solve for x.

$9x - 2(4x + 5) = 2x - (4 - x) - 12$

$9x - 8x - 10 = 2x - 4 + x - 12$

$x - 10 = 3x - 10$

$-x \quad -x$

$-10 = 2x - 10$

$+10 \quad +10$

$\frac{0}{2} = \frac{2x}{2}$

$x = 0$

3. The Independence Football team is buying jackets. The jackets will cost $30 each plus a one-time fee of $18 for the design on the jacket. The total number can be at most $2,238. The inequality $30x + 18 \leq 2{,}238$ can be solved to determine x, the number of jackets that can be purchased. Write and solve an inequality that represents the solution.

$\frac{30x}{30} \leq \frac{2220}{30}$

$x \leq 74$

4. What is the solution to the inequality?

$-1 - 6x - 6 > -11 - 7x$

$-6x - 7 > -11 - 7x$

$+7x \quad +7x$

$x - 7 > -11$

$+7 \quad +7$

$x > -4$

5. Write an equation that can be used to solve this problem, do not simplify. The sum of two consecutive even integers is 56.

$n + (n + 2) = 56$

6. Morgan already has the following test scores: 98, 87, 93, and 91. If she wants her test average to be a 93, what score must she earn on her next test?

$\frac{98 + 87 + 93 + 91 + x}{5} = 93$

$369 + x = 465$

$x = 96$

7. A company uses the formula $T = 31c + 1{,}513p$ to determine the total cost to purchase c cases and p phones. Write a formula that can be used to determine the total number of phones purchased, given the total cost, T, and the number of cases purchased.

$\frac{T - 31c}{1513} = \frac{1513p}{1513}$

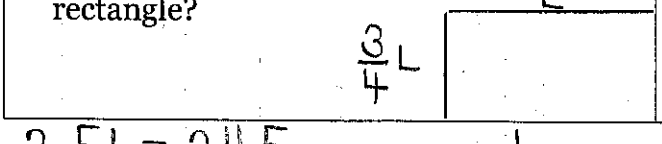
$p = \frac{T - 31c}{1513}$

8. If 21 more than 3 times a number is -24, what is the number? Write and solve an equation to find the number.

$3n = -45$

$n = -15$

9. The width of a rectangle is $\frac{3}{4}$ its length. The perimeter of the rectangle is 245 feet. What is the length, in feet, of the rectangle?



$3.5L = 245$

$L = 70$ ft.

10. Bunn's Cakes charges $4 per person and a $25 set-up fee to design a cake. Write an equation to find the number of guests (x) that could eat cake at the party if they have a budget of $1,429 for cake.

$4x + 25 = 1429$ x = # of guests

$-25 \quad -25$

$4x = 1404$

$x = 351$

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Unit 1: Expressions, Equations, and Inequalities STUDY GUIDE

11. Keyshawn and Trey begin saving money each week. After x weeks, the following functions represent the amount of money they have saved.

Keyshawn	$f(x) = 5x + 36$
Trey	$g(x) = 8x + 9$

$5X+36=8X+9$

After how many weeks will they have the same amount of money? $27=3X$ $X=9$ weeks

12. The sum of three consecutive even integers is −66. What is the value of the smallest of the three integers?

$n+(n+2)+(n+4)=-66$

$3n+6=-66$

$3n=-72$

$n=-24$

13. Solve the inequality: $X<2.80$

$-4(2x + 3) - 10x > 14(x - 8) + 3x$

$-8X-12-10X>14X-112+3X$

$100>35X$ $-18X-12>17X-112$

$2.80>X$ $+18X \quad +18X$

$-12>35X-112$

14. 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?

$\frac{90+93+85+87+88+X}{6}=90$

$443+X=540$ $X=97$

15. 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. $x - 3 = x - 3$

16. The expression $35n + 14f + 6p + 18d$ represents the cost, in dollars, to purchase n cases of paper, f packages of file folders, p packs of pencils, and d flash drive. What is represented by each of the following parts of the expression?

$35n$ → cost $35 per case of paper

14 → cost of one pack of folders

$6p$ cost $6 per pack of paper

d number of flash drives purchased

17. The length of a rectangle is 8 inches more than the width. The perimeter is 80 inches. Find the **area** of the rectangle.

W+8 | W | W | W+8

$4W+16=80$

$4W=64$

$W=16$

$L=24$

$A=384\text{in}^2$

18. Five less than the quotient of a number and 3 is −7. What is half the number?

$\frac{X}{3}-5=-7$

$+5 \quad +5$

$\frac{X}{3}=-2$ $\frac{X}{2}=-3$

$X=-6$

19. The perimeter of triangle RST is 6x-7. If side length RS is x+2 and RT is 2x-1, what is the length of side ST?

$RS+ST+RT=6X-7$

$X+2+ST+2X-1=6X-7$

$3X+1+ST=6X-7$

$-3X-1 \quad -3X-1$

$ST=3X-8$

20. Tory and Samuel purchased pencils. Tory purchased 4 times as many pencils than Samuel. If they purchased 35 total pencils, how many pencils did Tory purchase?

$X=$ # of pencils Sam purchased

$X+4X=35$

$5X=35$

$\frac{5X}{5}=\frac{35}{5}$

$X=7$

$4X=28$ pencils

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21. If $3(p-3)-5p<-3p-6$ and x is an integer, what is the greatest possible value of $x+3$?

5

SEE pg. 4 FOR WORK

22. Solve:

$$\frac{6}{10}x+\frac{2}{5}=\frac{1}{2}x-\frac{3}{5}$$

$x=-10$

SEE pg. 4 FOR WORK

23. Simplify the expression using the correct order of operations.

$5+6(3^3-15)^2$

$5+6(27-15)^2$

$5+6(12)^2$

$5+6(144)$

$5+864$

869

24. What are the terms, variables, constants, and coefficients of the expression below?

$2xy^3+5-x^2y$

Terms: $2xy^3$, 5, $-x^2y$

Variables: x, y

Coefficients: $2, -1$

Constants: 5

25. The side lengths of triangle KMN are three consecutive odd integers. The perimeter of the triangle 165cm. What is the length of the longest side?

$n+(n+2)+(n+4)=165$

$3n+6=165$

$3n=159$

$n=53$

$n+4=57$ cm

26. $V=\frac{1}{3}Bh$ Solve for B.

$3(V)=\left(\frac{1}{3}Bh\right)3$

$\frac{3V}{h}=\frac{Bh}{h}$

$B=\frac{3V}{h}$

27. Solve for h. $V=\frac{1}{3}Bh$

$3(V)=\left(\frac{1}{3}Bh\right)3$

$\frac{3V}{B}=\frac{Bh}{B}$

$\frac{3V}{B}=h$

28. In the inequality $3x-8>16$, which phrase accurately and completely describes x?

A. At most 8
B. Exactly 8
C. Less than 8
D. More than 8

$\frac{3x}{3}>\frac{24}{3}$

$x>8$

30. Marissa plans to create silk floral arrangements. The expression $13v+8f+6b+3m$ represents her cost in dollars, for the arrangements when she buys v vases, f stems of flowers, b stems of wood bark, and m packages of marbles. What does the term $13v$ represent?

IT COSTS 13 DOLLARS PER VASE

1) a) $50 = 4x + 7x - 8 + x$

$50 = 12x - 8$

$+8 \quad +8$

$\frac{60}{10} = \frac{12x}{10}$

$5 = x$

b) $5 + 2(3x + 4) = 43$

$5 + 6x + 8 = 43$

$6x + 13 = 43$

$-13 \quad -13$

$\frac{6x}{6} = \frac{30}{6}$

$x = 5$

c) $2(4x - 12) + 3x = 6x + 1$

$8x - 24 + 3x = 6x + 1$

$11x - 24 = 6x + 1$

$-6x \quad -6x$

$5x - 24 = 1$

$+24 \quad +24$

$5x = 25$

$x = 5$

d) $2(4x + 7) = 2x + 4$

$8x + 14 = 2x + 4$

$-2x \quad -2x$

$6x + 14 = 4$

$-14 \quad -14$

$\frac{6x}{6} = \frac{-10}{6}$

$x = -\frac{5}{3}$

21) $3(p - 3) - 5p < -3p - 6$

$3p - 9 - 5p < -3p - 6$

$-2p - 9 < -3p - 6$

$+3p \quad +3p$

$p - 9 < -6$

$+9 \quad +9$

$p < 3$

$2, 1, 0, -1, -2, \ldots$

$5 \quad 4 \quad 3 \quad 2 \quad 1$

biggest

22) $\frac{10}{1}\left(\frac{6}{10}x + \frac{2}{5}\right) = \left(\frac{1}{2}x - \frac{3}{5}\right)\frac{10}{1}$

$\frac{60x}{10} + \frac{20}{5} = \frac{10}{2}x - \frac{30}{5}$

$6x + 4 = 5x - 6$

$-5x \quad -5x$

$x + 4 = -6$

$-4 \quad -4$

$x = -10$