Unit 1 Review

(Chapters 1-3)

$\dfrac{-76}{4}$

SCORE _____

1. Simplify $2(x + 3) - (2x - 1)$.

   $2x + 6 - 2x + 1$

   1. _____ 7

2. Name the sets of numbers to which 457 belongs.

   2. _____ N, W, Z, R

3. The sum of a number and 17 more than twice the same number is 101. Find the number. $x + 2x + 17 = \overset{9\cancel{10}11}{101}$ ⟹ $3x = 84$, $x = 4\cancel{2}3$

   3. _____ $x = 28$

4. Evaluate $5 - |a + 5b|$ if $a = -12$ and $b = 2$.

   $5 - |-12 + 5(2)| = 5 - |-12 + 10| = 5 - |-2| = 5 - 2 = 3$

   4. _____ 3

5. Define a variable and write an inequality. Then solve. A local summer baseball team plays 20 games each season. So far, they have won 9 games and lost 2. How many more games must they win this season to win at least 75% of all their games? $9 + x \geq 15$ ⟶ $20 \div 5$ $5x = \frac{3}{4} = .75$ $\frac{15}{?}$

   5. _____ at least 6

6. Solve $3 + 2(1 + x) > 4$ or $2x + 14 \leq 8$. Graph the solution set on a number line.

   $2x > -5$ $3 + 2 + 2x > 4$ $2x + 14 \leq 8$ ⟶ $x \leq -3$
   $x > -\frac{1}{2}$ $5 + 2x > 4$ $2x \leq -6$

   6. _____ $x \leq -3, x \geq -\frac{1}{2}$

7. Solve $3 + |2y - 1| \geq 1$. Graph the solution set on a number line.

   $|2y - 1| \geq -2$ all real #s   (any absolute value is always greater than a negative #).

   7. _____ all real #'s

8. If $f(x) = \dfrac{5x^2 - 4}{x}$ find $f(4)$. $\dfrac{5(4)^2 - 4}{4} = \dfrac{5(16) - 4}{4}$

   $5(4) - 1$

   8. _____ 19

9. Write an equation in slope-intercept form for the line that passes through $(3, 5)$ and $(-2, 1)$. $\dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{1 - 5}{-2 - 3} = \dfrac{-4}{-5} = \frac{4}{5}$ $5 = \frac{4}{5}(3) + b$ $\frac{13}{5} = b$

   9. _____ $y = \frac{4}{5}x + \frac{13}{5}$

10. Write an equation for the line that passes through $(0, 7)$ and is perpendicular to the line whose equation is $y = \frac{1}{2}x - 1$.
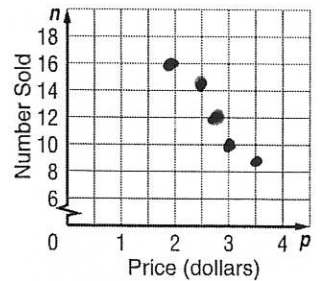
    $m = -2$

    10. _____ $y = -2x + 7$

For Questions 11 and 12, use the set of data in the table.

The table shows the relationship between the price of a comic book and the number of copies sold.

Price p (in dollars)	2.00	2.50	2.75	3.00	3.50
Numbers sold n	16	13	12	10	7

$\dfrac{1.5}{-9} = \dfrac{-15}{90} = -\frac{1}{6}$

$16 = -\frac{1}{6}(2) + b$

$16 = -\frac{1}{3} + b$

$b = 16\frac{1}{3} = \frac{49}{3}$

11. Draw a scatter plot for the data.

11.

12. Use two ordered pairs to write a prediction equation. Then use your prediction equation to predict the number of comic books sold when the price is $4.50.

    $y = -\frac{1}{6}(4.50) + \frac{49}{3}$ $-\frac{1}{6}(4.50) = -.75 + 16.3$

    12. _____ $y = -\frac{1}{6}x + \frac{49}{3}$

13. Evaluate $h\left(-\frac{2}{3}\right)$ if $h(x) = [\![x - 2]\!]$.

    $[\![-\frac{2}{3} - 2]\!] = [\![-2\frac{2}{3}]\!]$

    13. _____ ≈ 15.58

14. Describe the system $6x - 2y = 10$ and $9x - 3y = 8$ as *consistent and independent*, *consistent and dependent*, or *inconsistent*.

    $-2y = -6x + 10$ $\begin{cases} -3y = -9x + 8 \\ \dfrac{-3y}{-3} = \dfrac{-9x + 8}{-3} \end{cases}$

    14. _____ -2

    $y = 3x - 5$ $y = 3x + 8\frac{1}{3}$

Unit 1 Review (continued)

(Chapters 1-3)

15. Solve the system of equations at the right by using substitution.

$4x - 2y = 2$
$y = -4x - 7$ ← $y = -4(-1) - 7$

$4x - 2(-4x - 7) = 2$ $= 4 - 7$
$4x + 8x + 14 = 2$
$12x = -12$ $x = -1$ $y = -3$

15. $(-1, -3)$

16. Solve the system of equations at the right by using elimination.

$x + 3y = 5$
$3x - y = 5$ × 3

$x + 3y = 5$ ← $2 + 3y = 5$
$9x - 3y = 15$ $3y = 3$
_____ $y = 1$
$10x = 20$ $x = 2$

16. $(2, 1)$

For Questions 17-19, use the following information.

A furniture company displays bedroom sets which require 21 square meters of space and living room sets which require 42 square meters of space. The company, which has 546 square meters of available space, wants to display at least 6 bedroom sets and at least 5 living room sets.

$21b + 42l \leq 546$
$b \geq 6, l \geq 5$

17. $b \geq 6, l \geq 5$

6, 10
6, 5   (5, 5)

18. _____

19. $250,000$

17. Let b represent the number of bedroom sets and , l represent the number of living room sets. Write a system of inequalities to represent the number of furniture sets that can be displayed.

$21b + 42l \leq 546$
$b \geq 6, l \geq 5$

18. Draw the graph showing the feasible region. Label the coordinates of the vertices of the feasible region.

19. If a bedroom set sells for $10,000 and a living room set sells for $18,000, determine the number of bedroom sets and living room sets that must be sold to maximize the amount collected.
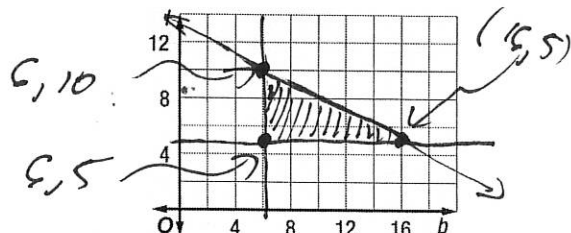
$Profit = 10,000b + 18,000l$

test vertices from #18, plug in to find max value;

$(16, 5) \rightarrow 250,000$

20.

21.

22.

23.

24.

25.