Math 101, Practice Test for Chapter 2 Name Solutions

Show all work for full credit. Please use pencil and write legibly.
(4 points each numbered problem)

1. Simplify

$$-5xy - (-8xy)$$

$= -5xy + 8xy$
$= (-5 + 8)xy$

$= 3xy$

2. Simplify

$$\frac{1}{6}x - \frac{1}{15}x$$

$$= \left(\frac{1}{6} - \frac{1}{15}\right)x$$
$$= \left(\frac{1 \bullet 5}{6 \bullet 5} - \frac{1 \bullet 2}{15 \bullet 2}\right)x$$
$$= \left(\frac{5}{30} - \frac{2}{30}\right)x$$
$$= \frac{3}{30}x$$
$$= \frac{1}{10}x$$

3. Simplify

$$-15 - 4(6x - 5)$$

$= -15 + -4(6x + -5)$
$= -15 + -24x + -4 \bullet -5$
$= -24x + -15 + 20$
$= -24x + 5$

4. Simplify

$$(9m - 1) - (5m - 3)$$

$= (9m + -1) + -1 \bullet (5m + -3)$
$= 9m + -1 + -5m + 3$
$= 9m + -5m + -1 + 3$
$= 4m + 2$

5. Solve and check.

(a) $x - 4 = 15$

$+4 \quad +4$

$x + 0 = 19$

$x = 19$

Check:

$x - 4 = 15$

$19 - 4 =? 15$

$15 = 15$

(b) $x + 5 = -11$

$-5 \quad -5$

$x + 0 = -16$

$x = -16$

Check:

$x + 5 = -11$

$-16 + 5 =? -11$

$-11 = -11$

6. Solve and check.

(a) $10y = 80$

$\frac{10y}{10} = \frac{80}{10}$

$y = 8$

Check:

$10y = 80$

$10 \bullet 8 =? 80$

$80 = 80$

(b) $-20 = 5h$

$\frac{-20}{5} = \frac{5h}{5}$

$-4 = h$

Check:

$-20 = 5h$

$-20 =? 5 \bullet -4$

$-20 = -20$

7. Solve and check.

$5x - 11 = -21$

$+11 \quad +11$

$5x + 0 = -10$

$\frac{5x}{5} = \frac{-10}{5}$

$x = -2$

Check: $5x - 11 = -21$

$5 \bullet -2 - 11 =? -21$

$-10 - 11 =? -21$

$-10 + -11 =? -21$

$-21 = -21$

8. Solve and check.

$9 - 10w = 3 - 12w$

$9 + -10w = 3 + -12w$

$+12w \quad +12w$

$9 + 2w = 3 + 0$

$-9 \quad -9$

$0 + 2w = -6$

$2w = -6$

$\frac{2w}{2} = \frac{-6}{2}$

$w = -3$

Check: $9 - 10w = 3 - 12w$

$9 - 10 \bullet (-3) =? 3 - 12 \bullet (-3)$

$9 + -10 \bullet (-3) =? 3 + -12 \bullet (-3)$

$9 + 30 =? 3 + 36$

$39 = 39$

9. Solve.

$$5(x-4)-5=4(5-x)$$

$$5(x+-4)+-5=4(5+-x)$$
$$5x+-20+-5=20+-4x$$
$$5x+-25=20+-4x$$
$$\underline{+4x} \qquad \underline{+4x}$$
$$9x+-25=20+0$$
$$\underline{+25} \quad \underline{+25}$$
$$9x+0=45$$
$$\frac{9x}{9}=\frac{45}{9}$$
$$x=5$$

10. Solve.

$$\frac{1}{3}x-4=\frac{1}{2}x+1$$

$$6\left(\frac{1}{3}x-4\right)=6\left(\frac{1}{2}x+1\right)$$

$$6\cdot\frac{1}{3}x-6\cdot4=6\cdot\frac{1}{2}x+6\cdot1$$

$$2x-24=3x+6$$
$$\underline{-2x} \qquad \underline{-2x}$$
$$0-24=x+6$$
$$\underline{-6} \qquad \underline{-6}$$
$$-30=x+0$$
$$-30=x$$

11. Solve.

$$-0.35x+5.5=0.15x-4.5$$

$$100(-0.35x+5.5)=100(0.15x-4.5)$$
$$-35x+550=15x-450$$
$$\underline{+35x} \qquad \underline{+35x}$$
$$0+550=50x-450$$
$$\underline{+450} \qquad \underline{+450}$$
$$1000=50x-0$$
$$\frac{1000}{50}=\frac{50x}{50}$$
$$20=x$$

12. Solve.

$$\frac{5}{7}x=-\frac{3}{10}$$

$$\frac{7}{5}\cdot\frac{5}{7}x=\frac{7}{5}\cdot-\frac{3}{10}$$
$$x=-\frac{21}{50}$$

13. Solve for a.

$$X = 7a + b$$
$$\underline{-b \qquad -b}$$
$$X - b = 7a + 0$$
$$X - b = 7a$$
$$\frac{X-b}{7} = \frac{7a}{7}$$
$$\frac{X-b}{7} = a$$

14. Solve for y.

$$12x - 4y = 16$$
$$\underline{-12x \qquad -12x}$$
$$0 - 4y = -12x + 16$$
$$-4y = -12x + 16$$
$$\frac{-4y}{-4} = \frac{-12x+16}{-4}$$
$$y = 3x + -4$$
$$y = 3x - 4$$

15. Seven times the sum of a number and two is twenty more than the number. What is the number?

Let x = the number

$$7(x + 2) = x + 20$$
$$7x + 14 = x + 20$$
$$\underline{-x \qquad -x}$$
$$6x + 14 = 0 + 20$$
$$6x + 14 = 20$$
$$\underline{-14 \quad -14}$$
$$6x + 0 = 6$$
$$6x = 6$$
$$\frac{6x}{6} = \frac{6}{6}$$
$$x = 1$$

16. An investor earned \$400 on an initial principal investment of \$10,000 after one year. What was the interest rate as a percent?

Let x = the rate as a percent

400 is what percent of 10,000?

$$400 = \frac{x}{100} \cdot 10{,}000$$
$$400 = 100x$$
$$\frac{400}{100} = \frac{100x}{100}$$
$$4 = x$$

The rate is 4%.

17. A coin purse contains only nickels and dimes and there are five times as many dimes as nickels. The coins have a value of $6.60. How many of each coin is in the purse?

Let x = the number of nickels

	Dimes	Nickels
Number of coins	$5x$	x
Value of each coin	0.10	0.05
Total value of coin	$0.10(5x)$	$0.05x$

$$6.60 = 0.10(5x) + 0.05x$$
$$6.60 = 0.50x + 0.05x$$
$$100(6.60) = 100(0.50x + 0.05x)$$
$$660 = 50x + 5x$$
$$660 = 55x$$
$$\frac{660}{55} = \frac{55x}{55}$$
$$12 = x$$

12 nickels and 60 dimes

18. An electrician cuts a 90 foot wire into three pieces. The second piece is fifteen feet longer than the first and the third is three times the first. How long is each piece?

Let x = the length of the first piece

First piece	x
Second piece	$x + 15$
Third piece	$3x$

$$90 = x + x + 15 + 3x$$
$$90 = 5x + 15$$
$$-15 \quad -15$$
$$75 = 5x + 0$$
$$75 = 5x$$
$$\frac{75}{5} = \frac{5x}{5}$$
$$15 = x = 1^{st} \text{ piece}$$
$$30 = 2^{nd} \text{ piece}$$
$$45 = 3^{rd} \text{ piece}$$

19. The length of a rectangle is 18 cm more than the width. If the perimeter of the rectangle is 204 cm, then what are the length and the width?

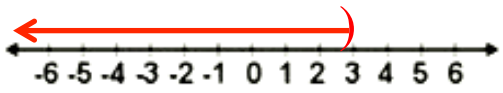
length	$x + 18$
width	x

Perimeter = 2 • length + 2 • width
$$204 = 2 \cdot (x + 18) + 2 \cdot x$$
$$204 = 2x + 36 + 2x$$
$$204 = 4x + 36$$
$$-36 \quad -36$$
$$168 = 4x + 0$$
$$\frac{168}{4} = \frac{4x}{4}$$
$$42 = x$$

width = 42
length = 60

20. Solve, graph, and write the solution set in interval notation.

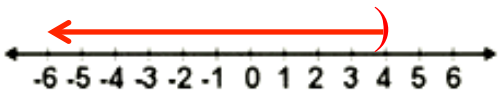
$$x - 5 < -2$$
$$+5 \quad +5$$
$$x + 0 < 3$$
$$x + 0 < 3$$
$$x < 3$$



Interval notation: $(-\infty, 3)$

21. Solve, graph, and write the solution set in interval notation.

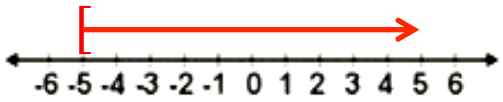
$$3x + 5 < 17$$
$$-5 \quad -5$$
$$3x + 0 < 12$$
$$\frac{3x}{3} < \frac{12}{3}$$
$$x < 4$$



Interval notation: **$(-\infty, 4)$**

22. Solve, graph, and write the solution set in interval notation.

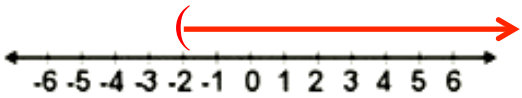
$$5 - 2x \le 15$$
$$-5 \qquad -5$$
$$0 - 2x \le 10$$
$$\frac{-2x}{-2} \ge \frac{10}{-2}$$
$$x \ge -5$$



Interval notation: **$[-5, \infty)$**

23. Solve, graph, and write the solution set in interval notation.

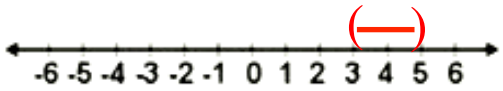
$$-\frac{1}{2}x < 1$$
$$-2 \cdot \left(-\frac{1}{2}x\right) > -2 \cdot 1$$
$$x > -2$$



Interval notation: **$(-2, \infty)$**

24. Solve, graph, and write the solution set in interval notation.

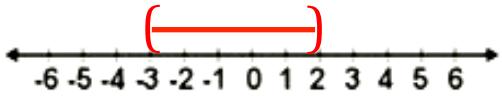
$$-2 < x - 5 < 0$$
$$+5 \qquad +5 \quad +5$$
$$3 < x + 0 < 5$$
$$3 < x < 5$$



Interval notation: **$(3, 5)$**

25. Solve, graph, and write the solution set in interval notation.

$$-13 < 4x - 1 < 7$$
$$\underline{+1} \quad \underline{+1} \quad \underline{+1}$$
$$-12 < 4x + 0 < 8$$
$$\frac{-12}{4} < \frac{4x}{4} < \frac{8}{4}$$
$$-3 < x < 2$$



Interval notation: **(–3, 2)**