Math 55   Ch. 2 Practice Test   Name: _____

*Double check your solutions! Use Algebraic Notation AND Show All of Your Work. You may **not** leave to use the restroom. You may use a calculator, but not any scratch paper. Students are not allowed to share calculators!*

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1. Solve $x - 7 = {}^-16$

2. Solve $-\dfrac{x}{6} = 13$

3. Solve $\dfrac{1}{4}x - \dfrac{1}{6} = 4 + \dfrac{1}{3}x$

4. Solve $3(x - 4) + 2 = x + 2(x - 5)$

5. Solve the following formula for y: $6y - 5 = z + xy$

6. Turn 2.3% into a decimal number.

7. Turn $\dfrac{13}{25}$ into a percent.

8. What percent of 60 is 42?

9. Solve $7 - 3x \geq 27 + 2x$ Write the answers in both set-builder notation and interval notation.

10. Solve $7 < 1 - \dfrac{3}{4}x$ Write the answers in both set-builder notation and interval notation.

11. June's assets were originally valued at $78,000 in 1964. Today, her assets are worth $835,000. What is the percentage increase in value of June's assets? Round your answer to the nearest whole number percent.

12. The sum of two consecutive odd integers is 116. Find the sum.

13. Jilly wants to brag to her friends on twitta and facespace about how much she saved on a new Louis Voittan handbag she just purchased using her credit card through shamazon's website. But she doesn't know what the original price of the handbag was. Jilly only knows that she paid $320 and was told it was 36% off of the retail (original) price. What was the original (retail) price of the handbag?

14. The perimeter of a triangle is 225 cm. If the sides are consecutive odd integers, find the length of each side. Please include the units.

15. Solve $\frac{3}{4}x = {}^-6$

16. Solve $2.6x - 3.2 = 7.6 - 4.9x$

17. Solve $\quad {}^-6x \leq 42 \quad$ Write the answers in both set-builder notation and interval notation.

18. Solve $\quad \frac{3}{4}y - \frac{1}{6} \geq \frac{7}{3}y \quad$ Write the answers in both set-builder notation and interval notation.

19. Solve the following formula for y: $\qquad 2x - 3y = 6$

20. What number is 42% of 714?

21. George and Marisol are hiking from San Diego, California to St. Louis, Missouri for a distance of about 1455 miles. The have hiked four times as many miles as they have left to go. How many miles do they still have to walk?

22. Harrison buys wood for a rectangular picture frame she is constructing. The perimeter of the frame is 138 cm. The length is to be 17 cm more than the width. Find the length and width of the outer edge of the picture frame.

23. Jilly landed a job in the valley and must now move there from Colorado. She can rent a small truck for a daily rate of $38 plus 19 cents per mile. If she takes three days to move, express as an inequality the number of miles she can drive and still stay within her budget of $230.

24. Five faculty members volunteered to pay for food and drinks at a holiday party. Bob paid $250, Alice paid 19% of the cost, Teresa paid two fifths of the cost, Harry paid one fourth the cost and Mac, who is independently wealthy agreed to pay $550. What was the total cost of the bill for food and drinks at the party?

Answers

1.   -9

2.   -78

3.   -50

4.   Every real number is a solution.

5. $y = \dfrac{z+5}{6-x}$

6.   0.023

7.   52%

8.   70%

9. $\{x| \quad x \le {}^-4\}, \qquad (-\infty, {}^-4]$

10. $\{x| \quad x < {}^-8\}, \qquad (-\infty, {}^-8)$

11.   971%

12.   57 and 59

13. $500

14.   73 cm, 75 cm, 77 cm

15.   -8

16. $\dfrac{36}{25}$ or 1.44

17. $\{x| \quad x \ge {}^-7\}, \qquad [{}^-7, \infty)$

18. $\{y| \quad y \ge {}^-2/19\}, \qquad [{}^-2/19, \infty)$

19. $y = \dfrac{2}{3} - 2$

20.   299.88

21.   291 miles

22. $W = 26$ cm and $L = 43$ cm

23. $\$38 \cdot (3) + \$0.19x \le \$230$

24. $5000

Double check your solutions! Use Algebraic Notation AND Show All of Your Work. You may not leave to use the restroom. You may use a calculator, but not any scratch paper. Students are not allowed to share calculators!

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1. (3 points) Solve $x - 7 = -16$

1. $\boxed{-9}$

$$X + (-7) = -16$$

$$X + (-7) + 7 = -16 + 7$$

$$X + 0 = -9$$

$$\boxed{X = -9}$$

Check $X - 7 = -16$

$$-9 - 7 = -16 \checkmark$$

$$-16 = -16$$

Key

2. (3 points) Solve $-\dfrac{x}{6} = 13$

2. $\boxed{-78}$

$$-\frac{1}{6} \cdot x = 13$$

$$-\frac{6}{1} \cdot \frac{-1}{6} \cdot x = -6 \cdot 13$$

$$1x = -78$$

$$\left(X = -78\right)$$

Check $-\dfrac{x}{6} = 13$

$$-\frac{(-78)}{6} = 13$$

$$13 = 13 \checkmark$$

3. (5 points) Solve $\frac{1}{4}x - \frac{1}{6} = 4 + \frac{1}{3}x$

$12\left(\frac{1}{4}x - \frac{1}{6}\right) = 12\left(4 + \frac{1}{3}x\right)$

$\frac{12}{1} \cdot \frac{1}{4}x - \frac{12}{1} \cdot \frac{1}{6} = 12 \cdot 4 + \frac{12}{1} \cdot \frac{1}{3}x$

$\qquad 3x - 2 \qquad = 48 + 4x$

$\qquad -4x + 2 \qquad\qquad + 2 - 4x$
_____

$\qquad -1x + 0 \qquad = 50 + 0$

$\qquad -1x = 50$

$\qquad \frac{-1x}{-1} = \frac{50}{-1}$ $\qquad \boxed{x = -50}$

check

$\frac{1}{4}x - \frac{1}{6} = 4 + \frac{1}{3}x$

$-12.\overline{6} = -12.\overline{6}$ ✓

Key

$\boxed{\mathbb{R}}$

4. _____

4. (4 points) Solve $3(x-4) + 2 = x + 2(x-5)$

$3x - 3 \cdot 4 + 2 = x + 2x - 2 \cdot 5$

$3x - 12 + 2 = 1x + 2x - 10$

$3x + (-12) + 2 = 3x + (-10)$

$3x + (-10) = 3x + (-10)$

$\quad -3x \qquad\qquad -3x$
_____

$\quad 0 + -10 = 0 + -10$

$\qquad -10 = -10 \implies$ Every real number is a solution to the eqn.

5. (4 points) Solve the following formula for y.

$$5.\ \boxed{y = \frac{z+5}{6-x}}$$

$$6y - 5 = z + xy$$

$$6y - 5 = z + xy$$

$$6y + (-5) = z + xy$$

$$6y + (-5) + 5 = z + xy + 5$$

$$6y + 0 = z + 5 + xy$$

$$6y = z + 5 + xy$$

$$6y - xy = z + 5 + xy - xy$$

$$6y - xy = z + 5 + 0$$

$$6y - xy = z + 5$$

$$6y - xy = z + 5$$

$$(6 - x)y = z + 5$$

$$\frac{(6-x)y}{6-x} = \frac{z+5}{6-x}$$

$$\boxed{y = \frac{z+5}{6-x}}$$

Key

6. (1 point) Turn 2.3% into a decimal number.

$$6.\ \boxed{0.023}$$

7. (1 point) Turn $\frac{13}{25}$ into a percent. $\frac{13 \cdot 4}{25 \cdot 4} = \frac{52}{100}$

$$7.\ \boxed{52\%}$$

8. (4 points) What percent of 60 is 42?

$$8.\ \boxed{70\%}$$

$$P \cdot 60 = 42$$

$$P = \frac{42}{60}$$

$$P = 0.7$$

9. (4 points) Solve $7 - 3x \geq 27 + 2x$ Write the answers in both set-builder notation and interval notation.
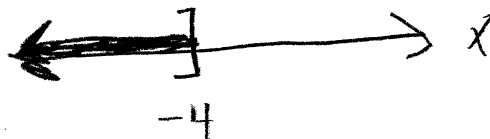
$$7 + {}^-3x \geq 27 + 2x$$
$$\underline{-7 \quad + {}^-2x \qquad -7 + {}^-2x}$$
$$0 + {}^-5x \geq 20 + 0$$

$$-5x \geq 20$$

$$\frac{-5x}{-5} \leq \frac{20}{-5}$$

$$x \leq -4$$

9. $\{x \mid x \leq -4\}$

9. $(-\infty, -4]$

-4

10. (4 points) Solve $7 < 1 - \dfrac{3}{4}x$ Write the answers in both set-builder notation and interval notation.

Key

$$7 < 1 - \frac{3}{4}x$$

$$4 \cdot 7 < 4\left(1 - \frac{3}{4}x\right)$$

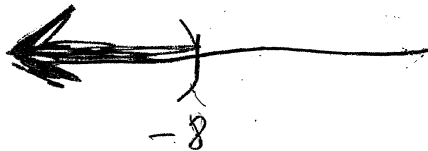$$28 < 4 - \frac{4}{1} \cdot \frac{3}{4}x$$

$$28 < 4 - 3x$$

$$28 - 4 < -3x$$

$$24 < -3x$$

$$-3x > 24$$

$$\frac{-3x}{-3} < \frac{24}{-3}$$

$$x < -8$$

10. $\{x \mid x < -8\}$

10. $(-\infty, -8)$

-8

11. (4 points) June's assets were originally valued at $78,000 in 1964. Today, her assets are worth $835,000. What is the percentage increase in value of June's assets? Round your answer to the nearest whole number percent.

P percent of the original value is the increase in value

P percent of $78,000 is $(835,000 - 7800)$

11. $\boxed{971 \%}$

$$P \cdot 78000 = 835,000 - 78,000$$

$$78000\, p = 757,000$$

$$P = \frac{757000}{78000}$$

Key

$$P \approx 9.705$$

12. (4 points) The sum of two consecutive odd integers is 116. Find the integers.

$$X + (X+2) = 116$$

12. $\boxed{57 \text{ and } 59}$

$$X + X + 2 = 116$$

$$1X + 1X + 2 = 116$$

$$2X + 2 = 116$$

$$2X + 2 - 2 = 116 - 2$$

$$2X + 0 = 114$$

$$2X = 114$$

$$\frac{2X}{2} = \frac{114}{2}$$

$$X = 57$$

Check

$\overset{1}{5}7$
$+59$
$\overline{116}$ ✓

(13)

20. (4 points) Jilly wants to brag to her friends on twitta and facespace about how much she saved on a new Louis Voittan handbag she just purchased using her credit card through shamazon's website. But she doesn't know what the original price of the handbag was. Jilly only knows that she paid $320 and was told it was 36% off of the retail (original) price. What was the original (retail) price of the handbag?

$$\left(\begin{array}{c}\text{Original}\\\text{price}\end{array}\right) - \left(36\% \text{ of } \begin{array}{c}\text{original}\\\text{price}\end{array}\right) = \left(\begin{array}{c}\text{purchase}\\\text{price}\end{array}\right) \quad 11 \boxed{\$500}$$

$$X - 0.36x = 320$$

$$0.64x = 320$$

$$\frac{0.64x}{0.64} = \frac{320}{0.64}$$

$$X = \$500$$

(14)

22. (4 points) The perimeter of a triangle is 225 cm. If the sides are consecutive odd integers, find the length of each side. Please include the units.

$$X + \left(x+2\right) + \left(x+4\right) = 225$$

$$X + X + 2 + X + 4 = 225$$

$$3x + 6 = 225$$

$$3x = 225 - 6$$

$$3x = 219$$

$$\frac{3x}{3} = \frac{219}{3}$$

12 $\boxed{\begin{array}{c}73\text{ cm}\\75\text{ cm}\\77\text{ cm}\end{array}}$

(15)　$\dfrac{3}{4}x = -6$　　　　　　　Check

$\dfrac{4}{3} \cdot \dfrac{3}{4} \cdot x = \dfrac{4}{3} \cdot \dfrac{-6}{1}$　　$\dfrac{3}{4} \cdot \dfrac{-8}{1} = \dfrac{-24}{4} = -6 ✓$

$1x = \dfrac{-24}{3}$

$\boxed{x = -8}$

(16)　$2.6x - 3.2 = 7.6 - 4.9x$

$10(2.6x - 3.2) = 10(7.6 - 4.9x)$

$26x - 32 = 76 - 49x$

$26x - 32 + 32 = 76 - 49x + 32$

$26x + 0 = 108 - 49x$

$26x + 49x = 108 - 49x + 49x$

$75x = 108 + 0$

$75x = 108$

$\dfrac{75x}{75} = \dfrac{108}{75}$

$x = \dfrac{108 \div 3}{75 \div 3}$

$\boxed{x = \dfrac{36}{25} \quad or \quad 1.44}$

Check

$2.6(1.44) - 3.2 = 7.6 - 4.9(1.44)$

$0.544 = 0.544 ✓$

(11) $\dfrac{-6x}{-6} \le \dfrac{42}{-6}$

$x \ge -7$

$\{x \mid x \ge -7\}$

$[-7, \infty)$
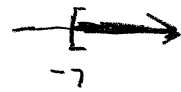
(18) $\dfrac{3}{4}y - \dfrac{1}{6} \ge \dfrac{7}{3}y$ $LCD = 12$

$12\left(\dfrac{3}{4}y - \dfrac{1}{6}\right) \ge 12 \cdot \left(\dfrac{7}{3}y\right)$

$\dfrac{12}{1} \cdot \dfrac{3}{4}y - \dfrac{12}{1} \cdot \dfrac{1}{6} \ge \dfrac{12}{1} \cdot \dfrac{7}{3} \cdot y$

$9y - 2 \ge 28y$

$9y + {}^{-}2 \ge 28y$

$\underline{-9y \qquad\qquad -9y}$

$0 + {}^{-}2 \ge 19y$
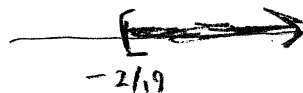
$-2 \ge 19y$

$19y \ge -2$

$\dfrac{19y}{19} \ge \dfrac{-2}{19}$

$y \ge {}^{-}2/19$

$\{y \mid y \ge {}^{-}2/19\}$

$[-2/19, \infty)$

(19) $2x - 3y = 6$

$2x + (-3y) = 6$ since $a - b = a + (-b)$

$2x + (-3y) + 3y = 6 + 3y$ add $3y$ to both sides to make the y term positive

$2x + 0 = 6 + 3y$

$2x = 6 + 3y$

$6 + 3y = 2x$ symmetric property $a = b$ is equivalent to $b = a$.

$3y + 6 = 2x$ since $a + b = b + a$

$3y + 6 - 6 = 2x - 6$ subtract 6 from both sides

$3y + 0 = 2x - 6$

$3y = 2x - 6$

$\dfrac{3y}{3} = \dfrac{2x - 6}{3}$

$1y = \dfrac{2x}{3} - \dfrac{6}{3}$ since $\dfrac{a + b}{c} = \dfrac{a}{c} + \dfrac{b}{c}$

$$\boxed{y = \tfrac{2}{3}x - 2}$$

(10)

$$X = (0.42)(714)$$

$$\boxed{X = 299.88}$$

(21) Given:

total distance = 1455 miles

$$\left(\begin{array}{c}\text{distance traveled}\\\text{thus far}\end{array}\right) = 4 \cdot \left(\begin{array}{c}\text{distance left}\\\text{to be traveled}\end{array}\right)$$

<u>unknown</u> Distance left to be traveled

This suggest we let x represent the number of miles left to be traveled.

Then, total distance = 1455, or

$$\left(\begin{array}{c}\text{distance traveled}\\\text{thus far}\end{array}\right) + \left(\begin{array}{c}\text{distance left}\\\text{to be traveled}\end{array}\right) = 1455, \text{ or}$$

$$4x + x = 1455$$

$$5x = 1455$$

$$\frac{5x}{5} = \frac{1455}{5}$$

$$\boxed{x = 291 \text{ miles}}$$