

Chapter 2 Practice

Disclaimer: Actual exam differs

Solve the equation.

1) $-59 = 7x - 3$

$-59 + 3 = 7x - 3 + 3$

$-56 = 7x$

$-\frac{56}{7} = x$

$x = -8$

1) $\underline{-8}$

2) $-10t - 4 = 6 + 6t$

$-10t + 10t - 4 = 6 + 6t + 10t$

$-4 = 6 + 16t$

$-4 - 6 = 6 - 6 + 16t$

$-10 = 16t$

$-\frac{10}{16} = t$ simplify

$-\frac{5}{8} = t$

(no decimals)

2) $\underline{-\frac{5}{8}}$

3) $80 = 15x + 5x$

$80 = 20x$

$4 = x$

$\frac{80}{20} = \frac{20x}{20}$

3) $\underline{4}$

4) $-5b + 9 = -7 + 8b$

$-5b + 5b + 9 = -7 + 8b + 5b$

$9 = -7 + 13b$

$9 + 7 = -7 + 7 + 13b$

$16 = 13b$

$\frac{16}{13} = b$ (no decimals !!)

4) $\underline{\frac{16}{13}}$

5) $\frac{7}{6}x + \frac{1}{6}x = 3x + \frac{1}{3} + \frac{5}{6}x$ LCD = 18

$\left(\frac{7}{6}\right) 18x + \frac{1}{6}(18)x = 3(18)x + \frac{1}{3}(18) + \frac{5}{6}(18)x$

$21x + 3x = 54x + 6 + 15x$

$24x = 69x + 6$

$24x - 69x = 69x - 69x + 6$

$-45x = 6$

$x = \frac{6}{-45} = -\frac{2}{15}$

(no decimals !!)

5) $\underline{-\frac{2}{15}}$

6) $-4m - 8 = 1 + 8m$

$-4m + 4m - 8 = 1 + 8m + 4m$

$-8 = 1 + 12m$

$-8 - 1 = 1 - 1 + 12m$

$-9 = 12m$

$-\frac{9}{12} = m$

$-\frac{3}{4} = m$ (no decimals)

6) $\underline{-\frac{3}{4}}$

7) $(y - 8) - (y + 4) = 7y$

$y - 8 - y - 4 = 7y$

$-12 = 7y$

$-\frac{12}{7} = y$ (no decimals)

7) $\underline{-\frac{12}{7}}$

8) $\frac{1}{4}(8x-20) = \frac{1}{5}(25x-10)$ DISTRIBUTE FRACTIONS 1ST

$$\begin{aligned} 2x-5 &= 5x-2 & -3 &= 3x \\ 2x-2x-5 &= 5x-2x-2 & \frac{-3}{3} &= x \\ -5 &= 3x-2 & -1 &= x \\ -5+2 &= 3x-2+2 \end{aligned}$$

8) -1

9) $\frac{2}{3}\left(10x-\frac{1}{6}\right) - \frac{3}{4} = \frac{1}{4}$ DISTRIBUTE FRACTIONS 1ST

$$\begin{aligned} \frac{20}{3}x - \frac{1}{9} - \frac{3}{4} &= \frac{1}{4} & \text{LCD} &= 36 & \rightarrow 240x - 31 &= 9 \\ \frac{20(36)}{3}x - \frac{1(36)}{9} - \frac{3(36)}{4} &= \frac{1(36)}{4} & \rightarrow 240x - 31 + 31 &= 9 + 31 \\ 240x - 4 - 27 &= 9 & 240x &= 40 & x &= \frac{40}{240} = \frac{1}{6} \text{ (no decimals)} \end{aligned}$$

9) $\frac{1}{6}$

10) $\frac{p}{3} - \frac{3p}{8} = 5$ LCD = 24

$$\begin{aligned} \frac{p}{3}(24) - \frac{3p}{8}(24) &= 5(24) \\ 8p - 9p &= 120 \\ -p &= 120 \end{aligned}$$

$p = \frac{120}{-1} = -120$

10) -120

Solve. Label any contradictions or identities.

11) $6x+6 = 6(x+8)+3$

$6x+6 = 6x+48+3$

$6x+6 = 6x+51$

$6x-6x+6 = 6x-6x+51$

$6=51$

CONTRADICTION
NO SOLUTION or \emptyset

11) NO SOLUTION
CONTRADICTION

12) $12m+120 = 4(3m+30)$

$12m+120 = 12m+120$

$12m-12m+120 = 12m-12m+120$

$120 = 120$

IDENTITY
SOLUTION is all
Real numbers
or \mathbb{R}

12) ALL Real
numbers
IDENTITY

Solve the formula for the indicated letter.

13) $V = \frac{1}{3}Bh$ for h 1ST Clear Fractions!

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

$3V = Bh$ divide by B

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

CAUTION: We cannot leave a complex fraction in the answer such as $h = \frac{V}{\frac{1}{3}B}$ ← incorrect

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

Solve the problem.

14) At many colleges, the number of "full-time-equivalent" students f is given by $f = \frac{n}{15}$, where n is the total number of credits for which students enroll in a given

semester. Determine the number of full-time-equivalent students on a campus in which students registered for a total of 23,745 credits.

$$f = \frac{n}{15} = \frac{23745}{15} = 1583$$

14) 1583

Solve the formula for the indicated letter.

15) $F = \frac{9}{5}C + 32$ for C Clear Fractions 1st

$$5F = \frac{9}{5}(5)C + 32(5)$$

$$5F = 9C + 160$$

$$5F - 160 = 9C + 160 - 160$$

$$\begin{array}{l} 5F - 160 = 9C \\ \hline 5F - 160 = 9C \quad \text{or} \\ \frac{5}{9}(F - 32) = C \end{array}$$

BOTH ARE CORRECT

15) $C = \frac{5}{9}(F - 32)$

16) $\frac{1}{a} + \frac{1}{b} = c$ for b Clear Fractions 1st: LCO = ab

$$\frac{1}{a} \cdot (ab) + \frac{1}{b} \cdot (ab) = (abc)$$

$$b + a = abc$$

$$b - b + a = abc - b$$

$$a = abc - b$$

$$a = b(ac - 1) \quad \text{Factor out "b"}$$

$$\frac{a}{ac - 1} = b \quad \text{divide by } (ac - 1)$$

16) $b = \frac{a}{ac - 1}$

Convert to percent notation.

17) $\frac{8}{20} = .40 = 40\%$ must have % sign

Because .40 is NOT written as a percent

17) 40%

Convert to decimal notation.

18) $90\% = 0.90$ (remember to drop % sign)

18) 0.9

Convert to decimal notation. Do not round.

19) $85.7\% = .0857$ (remember to drop % sign)

19) 0.857

Convert to percent notation.

$$20) \frac{15}{50} = \frac{15}{50} \times 100\% = 30\%$$

don't forget % sign

20) 30%

Solve.

21) What is 83% of 145 Okay to use decimal answer

$$X = 83\% (145)$$

$$X = .83 (145)$$

$$X = 120.35 \quad \text{DO NOT round}$$

21) 120.35

22) 32% of what number is 82? (Okay to use decimal answer...do not round)

$$32\% (X) = 82$$

$$X = 256.25$$

$$.32 X = 82$$

$$X = \frac{82}{.32}$$

22) 256.25

23) 902 is what percent of 1699? (okay to use decimal answer) (round to 1 decimal place)

$$902 = X (1699)$$

$$X = .530900529 \dots$$

$$\frac{902}{1699} = X$$

$$X = 53.1\%$$

23) 53.1%

24) During one year, the Green's real estate bill included \$269 for city services. The fire department received 30% of that amount. How much money went to the fire department? (Okay to use decimal answer...2 decimal places and don't forget units).

$$\text{amount} = 30\% (269)$$

$$\text{amount} = .30 (269)$$

$$= \$80.70 \quad (\text{money gets 2 decimal places and \$ sign})$$

24) \$80.70

Solve the problem.

25) If Gloria received a 5 percent raise and is now making \$22,050 a year, what was her salary before the raise? Round to the nearest dollar if necessary.

Let $X =$ amount before the raise

$$X + .05 X = 22050$$

$$1.05 X = 22050$$

$$X = \frac{22050}{1.05} = \$21,000$$

25) \$21,000

(CAUTION: IT WOULD BE INCORRECT TO TAKE 5% OF 22050 & THEN SUBTRACT IT !!!)

26) At the end of the day, a storekeeper had \$1498 in the cash register, counting both the sale of goods and the sales tax of 7%. Find the amount that is the tax. Round to the nearest dollar if necessary.

26) \$98

$x = \text{Sale of goods (pre tax)}$ $.07x = \text{Tax}$

$$x + .07x = 1498$$

$$1.07x = 1498$$

$$x = \frac{1498}{1.07}$$

$$x = 1400$$

SO TAX = $.07(1400) = \$98$

Solve using the five-step problem-solving process.

27) The sum of three consecutive integers is 447. Find the integers.

27) 148, 149, 150

$x = 1^{\text{st}}$
 $x+1 = 2^{\text{nd}}$
 $x+2 = 3^{\text{rd}}$

$$x + (x+1) + (x+2) = 447$$

MUST show steps algebraically

$$3x + 3 = 447$$

$$3x = 447 - 3$$

$$3x = 444$$

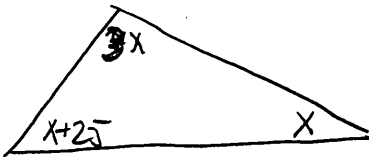
$$x = \frac{444}{3} = 148$$

$$x+1 = 149$$

$$x+2 = 150$$

28) The second angle of a triangle is 3 times as large as the first. The third angle is 25° more than the first. Find the measure of the smallest angle.

28) 31°



$$x + 3x + x + 25 = 180$$

$$5x + 25 = 180$$

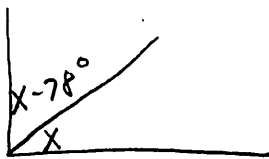
$$5x = 180 - 25$$

$$5x = 155$$

$$x = \frac{155}{5} = 31^\circ$$

29) The complement of an angle measures 78° less than the angle. Find the measure of the angle.

29) 84°



Complementary angles add to 90°

$$x + x - 78 = 90$$

$$2x - 78 = 90$$

$$2x - 78 + 78 = 90 + 78$$

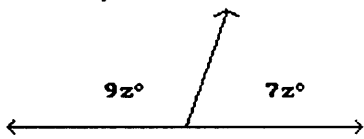
$$2x = 168$$

$$x = \frac{168}{2} = 84^\circ$$

Solve

30) Find the measures of the supplementary angles. Leave answers as decimals with 2 decimal places...include units)

30) $\frac{101.25^\circ}{78.75^\circ}$



$$9z + 7z = 180^\circ$$

$$16z = 180$$

$$z = \frac{180}{16} = 11.25$$

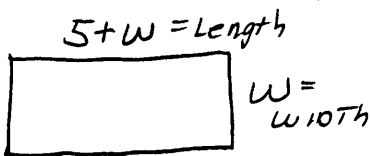
$$7z = 7(11.25) = 78.75^\circ$$

$$9z = 9(11.25) = 101.25^\circ$$

Solve using the five-step problem-solving process.

31) Find the length of a rectangular lot with a perimeter of 86 meters if the length is 5 meters more than the width. ($P = 2L + 2W$)

31) 24m



$$P = 2(5+w) + 2(w)$$

$$86 = 10 + 2w + 2w$$

$$86 = 10 + 4w$$

$$86 - 10 = 4w$$

$$76 = 4w$$

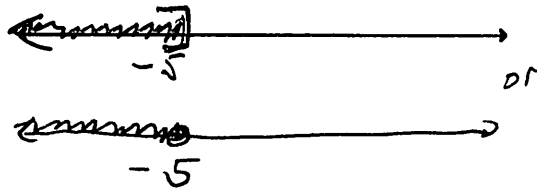
$$\frac{76}{4} = w$$

$$w = 19 \text{ m}$$

SO length =

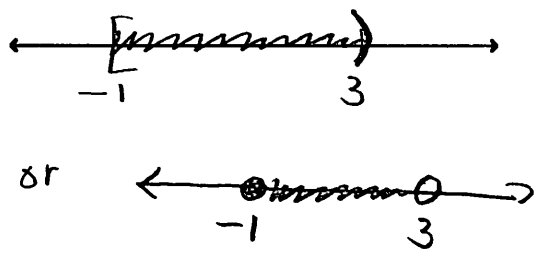
$$19 + 5 = 24 \text{ m}$$

Graph on a number line. $32) x \leq -5$



32) _____

33) $-1 \leq x < 3$

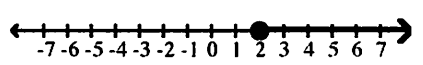


Bracket or closed dot
parentheses or open dot

33) _____

Describe the graph using set-builder notation.

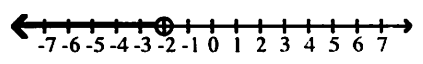
34)



set Braces → $\{x \mid x \geq 2\}$
 ↑ variable ↑ description
 single bar

34) _____
 $\{x \mid x \geq 2\}$

35)



35) _____
 $\{x \mid x < -2\}$

Solve using the addition and multiplication principles.

36) $-6y + 3 \leq -7y + 1$ (Write answer in set builder or interval notation)

$$-6y + 7y + 3 \leq 1 \quad y \leq -2$$

$$y + 3 \leq 1$$

$$y \leq 1 - 3$$

36) _____
 SET BUILDER → $\{y \mid y \leq -2\}$
 or
 INTERVAL → $(-\infty, -2]$

37) $\frac{x}{2} + 8 \leq 7$ (Write answer in set builder or interval notation)

$$\frac{x}{2}(2) + 8(2) \leq 7(2) \quad x \leq -2$$

$$x + 16 \leq 14$$

$$x \leq 14 - 16$$

37) _____
 SET BUILDER $\{x \mid x \leq -2\}$
 INTERVAL $(-\infty, -2]$

* NOTE: IF we divide or multiply both sides of an inequality by a negative number it changes the direction of the inequality sign.

38) $6 - 10y - 9 \geq -11y - 7$ (Write answer in set builder or interval notation)

$$\begin{aligned} -3 - 10y &\geq -11y - 7 & y &\geq -7 + 3 \\ -3 - 10y + 11y &\geq -7 & y &\geq -4 \\ -3 + y &\geq -7 \end{aligned}$$

38) _____
 SET BUILDER $\rightarrow \{y \mid y \geq -4\}$
 INTERVAL $[-4, \infty)$

39) $-15r - 24 \leq -3(4r + 2)$ (write answer in set builder or interval notation)

$$\begin{aligned} -15r - 24 &\leq -12r - 6 & -18 &\leq 3r \\ -24 &\leq -12r + 15r - 6 & -18 &\leq r \\ -24 &\leq 3r - 6 & -6 &\leq r \text{ or } r \geq -6 \\ -24 + 6 &\leq 3r \end{aligned}$$

39) _____
 SET BUILDER $\{r \mid r \geq -6\}$
 INTERVAL $[-6, \infty)$

40) $\frac{2}{3}(2x - 1) < -14$ (write answer in set builder or interval notation)

$$\begin{aligned} \frac{4}{3}x - \frac{2}{3} &< -14 & 4x &< -42 + 2 \\ \frac{4}{3}(3)x - \frac{2}{3}(3) &< -14(3) & 4x &< -40 \\ 4x - 2 &< -42 & x &< \frac{-40}{4} \\ 4x &< -40 & x &< -10 \end{aligned}$$

40) _____
 SET BUILDER $\{x \mid x < -10\}$
 INTERVAL $(-\infty, -10)$

41) $\frac{5}{6}\left(5x - \frac{2}{15}\right) - \frac{2}{5} < \frac{3}{5}$ (Write answer in set builder or interval notation)

LLO = 90

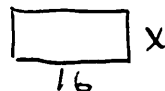
$$\begin{aligned} \frac{25x}{6} - \frac{1}{9} - \frac{2}{5} &< \frac{3}{5} \\ \frac{25(90)x - \frac{1}{9}(90) - \frac{2}{5}(90)}{375} &< \frac{3}{5}(90) \\ 375x - 10 - 36 &< 54 \\ 375x - 46 &< 54 \\ 375x &< 54 + 46 \\ 375x &< 100 \\ x &< \frac{100}{375} \rightarrow x < \frac{4}{15} \end{aligned}$$

41) _____
 $\{x \mid x < \frac{4}{15}\}$
 or $(-\infty, \frac{4}{15})$

Use an inequality

42) One side of a rectangle is 16 inches and the other side is x inches. What values of x will make the perimeter at least 52?

Perimeter ≥ 52



$$\begin{aligned} 2x + 2(16) &\geq 52 & 2x &\geq 20 \\ 2x + 32 &\geq 52 & x &\geq 10 \end{aligned}$$

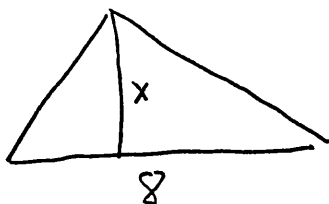
42) $x \geq 10$ inches
 $\{x \mid x \geq 10\}$
 $[10, \infty)$

Use an inequality and the five-step process to solve the problem.

43) The area of a triangle must be at most 44 square inches, the base is 8 inches, and the height is x inches. Find the possible values for x .

Area of a triangle = $\frac{1}{2}bh$ ($\frac{1}{2}$ base \times height)

$$\begin{aligned} \text{Area} &\leq 44 & \rightarrow & \frac{1}{2}(8x) \leq 44 \\ & & & 4x \leq 44 \\ & & & x \leq 11 \end{aligned}$$



BUT keep in mind $x \geq 0$
 Since length cannot be negative!

43) $0 < x \leq 11$ inches

Answer Key

Testname: 115CH2V4P

1) -8

2) $-\frac{5}{8}$

3) 4

4) $\frac{16}{13}$

5) $-\frac{2}{15}$

6) $-\frac{3}{4}$

7) $-\frac{12}{7}$

8) -1

9) $\frac{1}{6}$

10) -120

11) no solution; contradiction

12) all real numbers; identity

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

14) 1583

15) $C = \frac{5}{9}(F - 32)$

16) $b = \frac{a}{ac - 1}$

17) 40%

18) 0.9

19) 0.857

20) 30%

21) 120.35

22) 256.25

23) 53.1%

24) \$80.70

25) \$21,000

26) \$98

27) 148, 149, 150

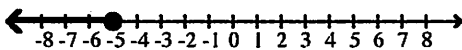
28) 31°

29) 84°

30) 101.25° and 78.75°

31) 24 m

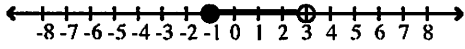
32)



Answer Key

Testname: 115CH2V4P

33)



34) $\{x|x \geq 2\}$

35) $\{x|x < -2\}$

36) $\{y|y \leq -2\}$

37) $\{x|x \leq -2\}$

38) $\{y|y \geq -4\}$

39) $\{r|r \geq -6\}$

40) $\{x|x < -10\}$

41) $\left\{x \mid x < \frac{4}{15}\right\}$

42) $x \geq 10$

43) $0 < x \leq 11$