

# Algebra I

## Chapters 1-4

### Semester Test Review



## Chapter 1

Evaluate each expression if  $x = 2$ ,  $y = 3$ ,  $z = 4$ ,  $a = \frac{4}{5}$ , and  $b = \frac{3}{5}$ .

1.  $x + 7$

2.  $3x - 5$

3.  $x + y^2$

4.  $x^3 + y + z^2$

5.  $6a + 8b$

6.  $23 - (a + b)$

7.  $\frac{y^2}{x^2}$

8.  $2xyz + 5$

9.  $x(2y + 3z)$

Find the solution of each equation if the replacement sets are  $X = \left\{ \frac{1}{4}, \frac{1}{2}, 1, 2, 3 \right\}$  and  $Y = \{2, 4, 6, 8\}$ .

1.  $x + \frac{1}{2} = \frac{5}{2}$

2.  $x + 8 = 11$

3.  $y - 2 = 6$

4.  $x^2 - 1 = 8$

5.  $y^2 - 2 = 34$

6.  $x^2 + 5 = 5\frac{1}{16}$

7.  $2(x + 3) = 7$

8.  $\frac{1}{4}(y + 1)^2 = \frac{9}{4}$

9.  $y^2 + y = 20$

Simplify each expression.

1.  $4x + 3y + x$

2.  $3a + 4b + a$

3.  $8rs + 2rs^2 + 7rs$

4.  $3a^2 + 4b + 10a^2$

5.  $6(x + y) + 2(2x + y)$

6.  $6n + 2(4n + 5)$

7.  $6(a + b) + a + 3b$

8.  $5(2x + 3y) + 6(y + x)$

9.  $5(0.3x + 0.1y) + 0.2x$

10.  $\frac{2}{3} + \frac{1}{2}(x + 10) + \frac{4}{3}$

11.  $z^2 + 9x^2 + \frac{4}{3}z^2 + \frac{1}{3}x^2$

12.  $6(2x + 4y) + 2(x + 9)$

Jennifer deposited a sum of money in her account and then deposited equal amounts monthly for 5 months, nothing for 3 months, and then resumed equal monthly deposits. Sketch a reasonable graph of the account history.

Alvin is mowing his front lawn. His mailbox is on the edge of the lawn. Draw a reasonable graph that shows the distance Alvin is from the mailbox as he mows. Let the horizontal axis show the time and vertical axis show the distance from the mailbox.

## Chapter 2

$$-9 + (-17)$$

$$-27 - 13$$

$$-11 - (-12)$$

$$-19 + (-3)$$

$$\frac{1}{4} + -\frac{3}{4}$$

$$-15 - 65$$

$$-2.5 + 3.2$$

$(5)(-5)(0)(4)$

$(-12)(-23)$

$(-22)(-3)(2)$

$(12)(-10)$

Simplify:

$4(-2x) - 8x$

$-3(3d + 2d)$

$-2x(2) + 2x(3y)$

$-5(2x + x) - 3(-xy)$

$4m(-2n) + 2d(-4e)$

$(-3)(-8n - 6m)$

$$\frac{-2 + (-4)}{(-2) + (-1)}$$

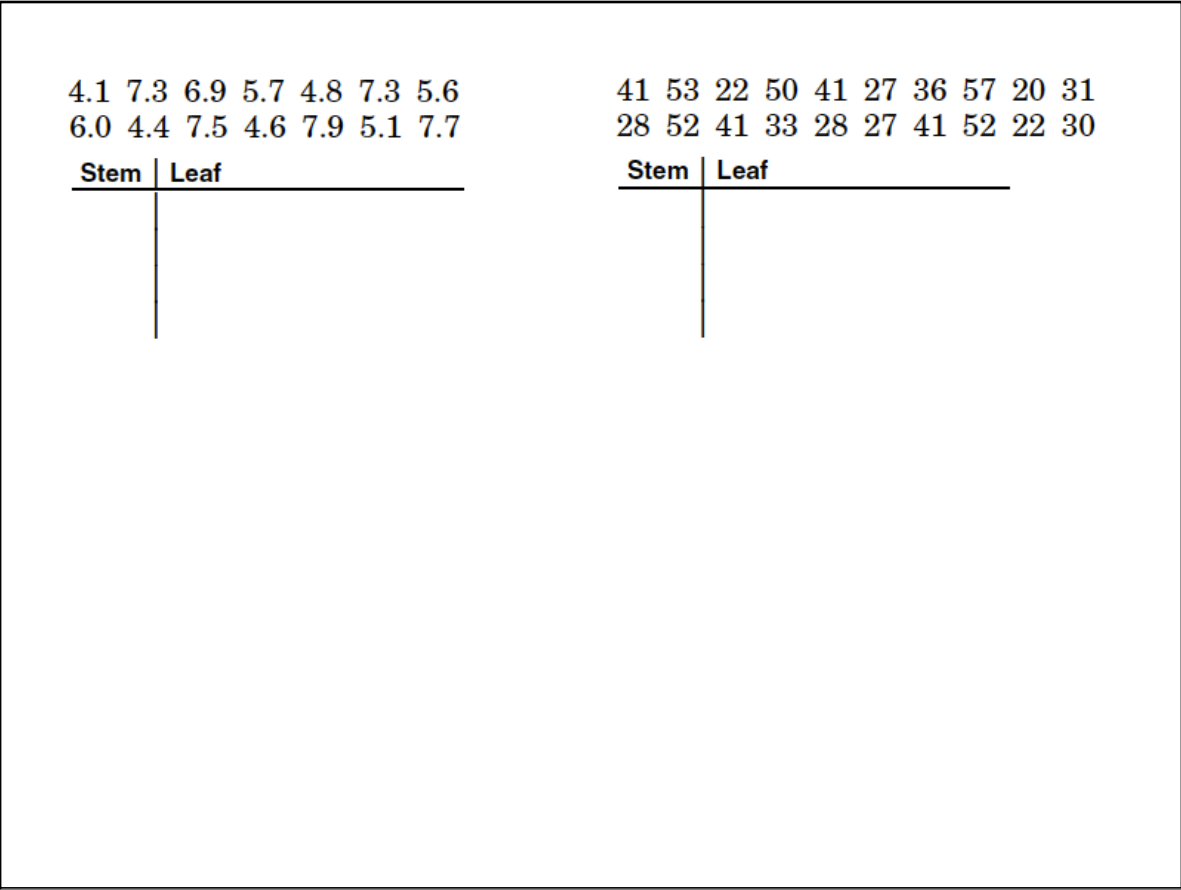
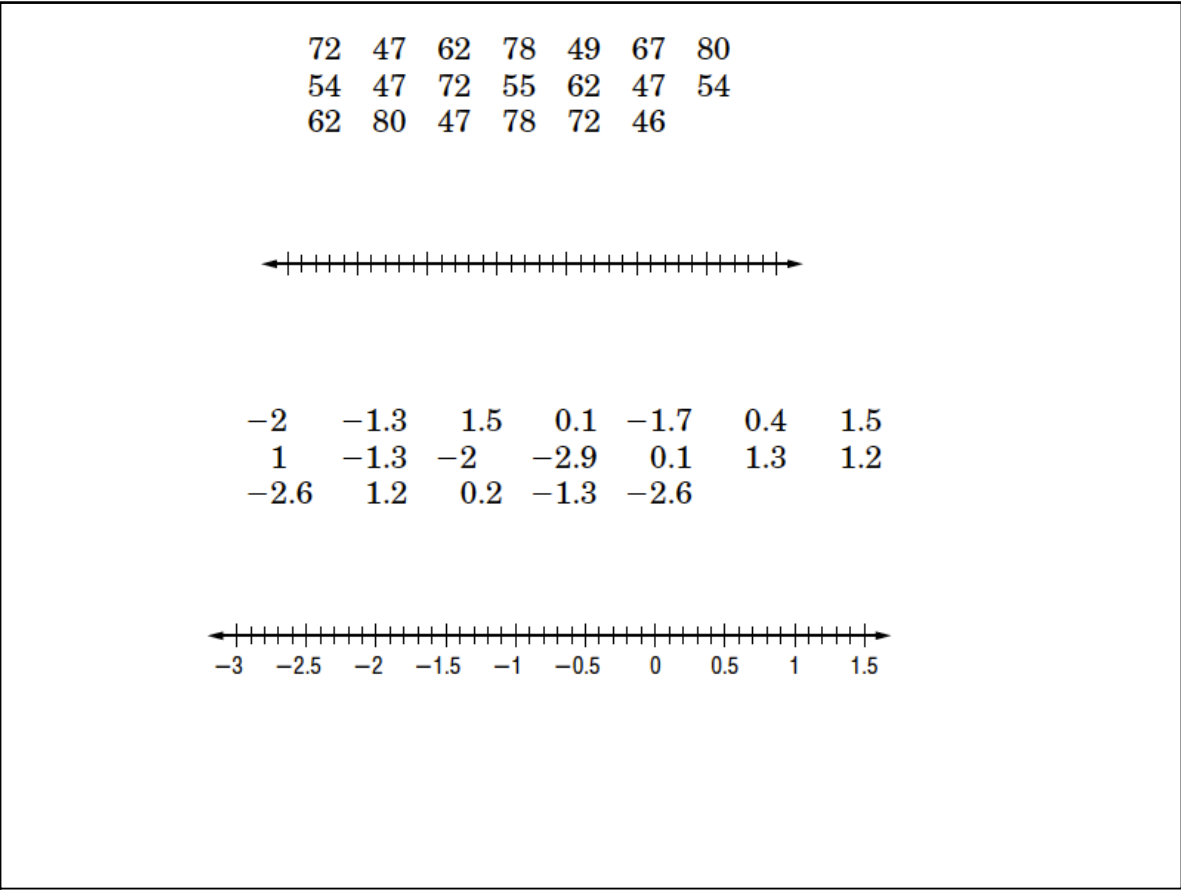
$$\frac{5(-10 + (-2))}{-2 + 1}$$

$$\frac{-6(-6 + 2)}{-10 + (-2)}$$

$$\frac{-12(2 + (-3))}{-4 + 1}$$

$$\frac{4(-12 + 4)}{-2(8)}$$

$$\frac{-4(-8 + (-4))}{-3 + (-3)}$$



A news team surveyed students in grades 9-12 on whether to change the time school begins. One student will be selected at random to be interviewed on the evening news. The table gives the results of the survey.

Grade	9	10	11	12
No change	6	2	5	3
Hour later	10	7	9	8

What is the probability the student selected will be in 9th grade?

What are the odds the student selected wants no change?

A student can select an elective class from the following: 3 in music, 5 in physical education, 2 in journalism, 8 in computer programming, 4 in art, and 6 in drama. Find each of the odds if a student forgets to choose an elective and the school assigns one at random.

The class is computer programming.

The class is drama.

The class is not physical education.

The class is not art.

## Chapter 3

**Solve:**

1.  $d - 8 = 17$

2.  $v + 12 = -5$

3.  $b - 2 = -11$

4.  $-16 = s + 71$

5.  $29 = a - 76$

6.  $-14 + y = -2$

7.  $8 - (-c) = 1$

8.  $78 + r = -15$

9.  $f + (-3) = -9$

10.  $4.2 = n + 7.3$

11.  $w + 1.9 = -2.5$

12.  $4.6 - (-b) = -0.4$

13.  $y - (-1.5) = 0.5$

14.  $a - 0.13 = -0.58$

15.  $k + (-4.21) = -19$

16.  $r + \frac{1}{5} = \frac{9}{10}$

17.  $\frac{5}{9} + q = \frac{2}{3}$

18.  $\frac{1}{3} = h + \frac{2}{5}$

19.  $\frac{1}{4} + x = -\frac{7}{12}$

20.  $y + \frac{4}{5} = \frac{3}{4}$

21.  $-\frac{7}{8} - (-n) = -\frac{7}{12}$

1.  $12z = 108$

2.  $-7t = 49$

3.  $18e = -216$

4.  $-22 = 11v$

5.  $-6d = -42$

6.  $96 = -24a$

7.  $\frac{c}{4} = 16$

8.  $\frac{a}{16} = 9$

9.  $-84 = \frac{d}{3}$

10.  $-\frac{d}{7} = -13$

11.  $\frac{t}{4} = -13$

12.  $31 = -\frac{1}{6}n$

13.  $-6 = \frac{2}{3}z$

14.  $\frac{2}{7}q = -4$

15.  $\frac{5}{9}p = -10$

16.  $\frac{a}{10} = \frac{2}{5}$

17.  $-0.4b = 5.2$

18.  $1.6m = -4$

1.  $5x + 2 = 27$

2.  $6x + 9 = 27$

3.  $5x + 16 = 51$

4.  $14n - 8 = 34$

5.  $0.6x - 1.5 = 1.8$

6.  $\frac{7}{8}p - 4 = 10$

7.  $16 = \frac{d - 12}{14}$

8.  $8 + \frac{3n}{12} = 13$

9.  $\frac{g}{-5} + 3 = -13$

10.  $\frac{4b + 8}{-2} = 10$

11.  $0.2x - 8 = -2$

12.  $3.2y - 1.8 = 3$

13.  $-4 = \frac{7x - (-1)}{-8}$

14.  $8 = -12 + \frac{k}{-4}$

15.  $0 = 10y - 40$

1.  $-3(x + 5) = 3(x - 1)$

2.  $2(7 + 3t) = -t$

3.  $3(a + 1) - 5 = 3a - 2$

4.  $75 - 9g = 5(-4 + 2g)$

5.  $5(f + 2) = 2(3 - f)$

6.  $4(p + 3) = 36$

7.  $18 = 3(2c + 2)$

8.  $3(d - 8) = 3d$

9.  $5(p + 3) + 9 = 3(p - 2) + 6$

10.  $4(b - 2) = 2(5 - b)$

11.  $1.2(x - 2) = 2 - x$

12.  $\frac{3 + y}{4} = \frac{-y}{8}$

13.  $\frac{a - 8}{12} = \frac{2a + 5}{3}$

14.  $2(4 + 2k) + 10 = k$

15.  $2(w - 1) + 4 = 4(w + 1)$

16.  $6(n - 1) = 2(2n + 4)$

17.  $2[2 + 3(y - 1)] = 22$

18.  $-4(r + 2) = 4(2 - 4r)$

19.  $-3(x - 8) = 24$

20.  $4(4 - 4k) = -10 - 16k$

21.  $6(2 - 2y) = 5(2y - 2)$



Solve each proportion.

1.  $\frac{-3}{x} = \frac{2}{8}$

2.  $\frac{1}{t} = \frac{5}{3}$

3.  $\frac{0.1}{2} = \frac{0.5}{x}$

4.  $\frac{x+1}{4} = \frac{3}{4}$

5.  $\frac{4}{6} = \frac{8}{x}$

6.  $\frac{x}{21} = \frac{3}{63}$

7.  $\frac{9}{y+1} = \frac{18}{54}$

8.  $\frac{3}{d} = \frac{18}{3}$

9.  $\frac{5}{8} = \frac{p}{24}$

10.  $\frac{4}{b-2} = \frac{4}{12}$

11.  $\frac{1.5}{x} = \frac{12}{x}$

12.  $\frac{3+y}{4} = \frac{-y}{8}$

13.  $\frac{a-8}{12} = \frac{15}{3}$

14.  $\frac{12}{k} = \frac{24}{k}$

15.  $\frac{2+w}{6} = \frac{12}{9}$

Find the final price of each item. When a discount and a sales tax are listed, compute the discount price before computing the tax.

1. Compact disc: \$16  
Discount: 15%

2. Two concert tickets: \$28  
Student discount: 28%

3. Airline ticket: \$248.00  
Superair discount: 33%

4. Shirt: \$24.00  
Sales tax: 4%

5. CD player: \$142.00  
Sales tax: 5.5%

6. Celebrity calendar: \$10.95  
Sales tax: 7.5%

7. Class ring: \$89.00  
Group discount: 17%  
Sales tax: 5%

8. Software: \$44.00  
Discount: 21%  
Sales tax: 6%

9. Video recorder: \$110.95  
Discount: 20%  
Sales tax: 5%

Solve each equation or formula for the variable specified.

1.  $d = rt$ , for  $r$

2.  $6w - y = 2z$ , for  $w$

3.  $mx + 4y = 3c$ , for  $x$

4.  $9s - 5g = -4u$ , for  $s$

5.  $ab + 3c = 2d$ , for  $b$

6.  $2p = kx - q$ , for  $x$

7.  $\frac{2}{3}m + a = a + c$ , for  $m$

8.  $\frac{2}{5}h + g = d$ , for  $h$

9.  $\frac{2}{3}y + v = s$ , for  $y$

10.  $\frac{3}{4}a - q = k$ , for  $a$

11.  $\frac{rx + 9}{5} = h$ , for  $x$

12.  $\frac{3b - 4}{2} = c$ , for  $b$

13.  $2w - y = 7w - 2$ , for  $w$

14.  $3\ell + y = 5 + 5\ell$ , for  $\ell$

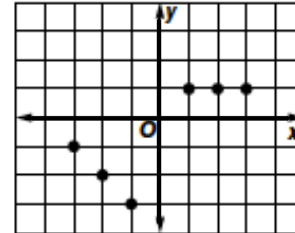
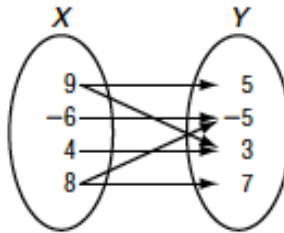
How many grams of sugar must be added to 60 grams of a solution that is 32% sugar to obtain a solution that is 50% sugar?

The Quik Mart has two kinds of nuts. Pecans sell for \$1.55 per pound and walnuts sell for \$1.95 per pound. How many pounds of walnuts must be added to 15 pounds of pecans to make a mixture that sells for \$1.75 per pound?

## Chapter 4

Express each relation as a set of ordered pairs. Then determine the domain and range of each and determine whether each relation is a function.

$x$	$y$
0	9
-8	3
2	-6
1	4



Find the coordinates of the vertices of each figure after the given transformation is performed. Graph the preimage and its image.

trapezoid  $EFGH$  with  
 $E(3, 2)$ ,  $F(3, -3)$ ,  
 $G(1, -2)$ , and  $H(1, 1)$   
 reflected over the  $y$ -axis

triangle  $XYZ$  with  $X(3, 1)$ ,  
 $Y(4, -2)$ , and  $Z(1, -3)$   
 rotated  $90^\circ$  counterclockwise  
 about the origin

triangle  $DEF$  with  $D(2, 3)$ ,  
 $E(4, 1)$ , and  $F(1, -1)$   
 translated 4 units left  
 and 3 units down

Solve each equation if the domain is  $\{-2, -1, 2, 3, 5\}$

$$y = 4 - 2x$$

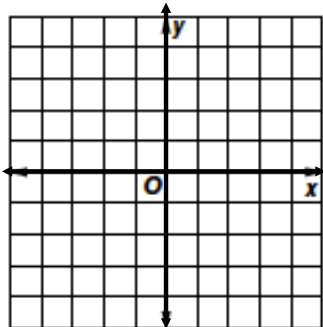
$$x = 8 - y$$

$$3x - 6y = 12$$

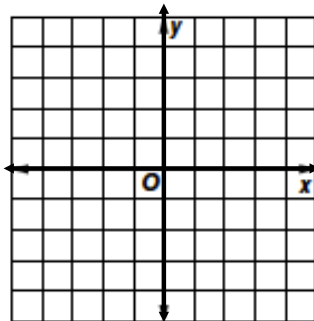
$$4x + 2y = 10$$

**Graph each equation.**

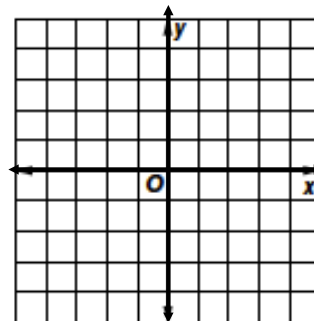
$$y = 4 - 2x$$



$$10x = -5y$$



$$4x = 2y + 6$$



# Semester Test on Thursday

