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Math on the Move

Answers to Practice Problems

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Developed by the National PASS Center under the leadership of the National PASS Coordinating Committee with funding from the Region 20 Education Service Center, San Antonio, Texas, as part of the Mathematics Achievement = Success (MAS) Migrant Education Program Consortium Incentive project. In addition, program support from the Opportunities for Success for Out-of-School Youth (OSY) Migrant Education Program Consortium Incentive project under the leadership of the Kansas Migrant Education Program.



Answers to Practice Problems – Lesson 1

Set A

- Addition (+)
 - Subtraction (-)
 - Multiplication (\times)
 - Multiplication (\times)
 - Division (\div)
 - Division (\div)
 - Subtraction (-)

- | | | | | | |
|-------|-------|------|-------|------|-------|
| a) 23 | b) 27 | c) 8 | d) 4 | e) 8 | f) 17 |
| g) 4 | h) 24 | i) 2 | j) 33 | k) 7 | l) 46 |

Set B

- $$\begin{array}{r} 190 \\ 120 \\ +147 \\ \hline 357 \end{array}$$
 It will take Teresa 357 minutes to watch the three movies

- $8 \times 40 = 320$ Celio will earn \$320 in one week

- $150 - 139 = 11$ Rosa only lost 11 pounds. She needs to lose 4 more pounds to reach her goal.
 $15 - 11 = 4$

- $$\begin{array}{r} 11 \\ 121 \overline{)1331} \\ \underline{-121} \\ 121 \\ \underline{-121} \\ 0 \end{array}$$
 1331 yen is worth 11 dollars.



Answers to Practice Problems – Lesson 2

Set A

- $15 - 18 = -3$. The Bills lost 3 yards
- $-12 + 3 = -9$. The change in the stock was -9.

3. $-.35$ $.50$ $-350 + 250 = -100$. Earl lost \$100.

| | | | | | |
|---------------|--------|---|--------------|-------|---|
| $\times 1000$ | $-.35$ | ← | $\times 500$ | $.50$ | ← |
| | -350 | | | 250 | |

Cost to make 1000 crates Money earned selling 500 crates

4. a) -6 b) -22 c) 7 d) -4
 e) 18 f) -28 g) -12 h) -16

Set B

- The answer will be positive. The absolute value of a number is always positive.
- Answers will vary.
- $300 + 20 = 320$ Carlos does have enough to pay his debts. He will have \$445 left over.
 $320 - 25 = 295$
 $295 + 1500 = 1795$
 $1795 - 400 = 1395$
 $1395 - 950 = 445$



Answers to Practice Problems – Lesson 3

Set A

1. a) -21 b) 57 c) -18 d) 4
 e) -3 f) 3 g) -4 h) 9

2. a) 4 b) 16 c) 144 d) 343
 e) 27 f) 64 g) 0 h) 729

Set B

1. The pattern is alternating between -1 and +1. If the exponent is an even number, the answer is +1. If the exponent is an odd number, the answer is -1.
2. a) $10 \times \underline{2}$ b) 10×2^2 c) 10×2^3 d) 10×2^9 e) $10 \times 2^{n-1}$
3. $47829174189^0 = 1$. Anything raised to the zero power is 1.



Answers to Practice Problems – Lesson 4

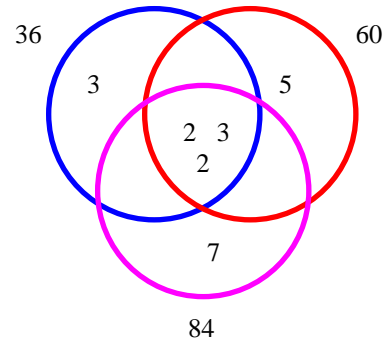
Set A

1. False. The factors of 24 are 1, 2, 3, 4, 6, 8, 12, and 24. The numbers, 4, 6, 8, 12, and 24 are not prime, they are composite.
2. a) $55 = 5 \times 11$ b) $63 = 7 \times 3 \times 3$ c) $144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$
 d) $210 = 2 \times 3 \times 5 \times 7$
3. a) GCF = 1 b) GCF = 33 c) GCF = 26 d) GCF = 46
 LCM = 15 LCM = 330 LCM = 910 LCM = 8050
 e) GCF = 1 f) GCF = 1 g) GCF = 2 h) GCF = 12
 LCM = 312 LCM = 1722 LCM = 4900 LCM = 120

Set B

1. Yes. The greatest common factor is 1. Every positive whole number has a factor of 1; therefore, every positive whole number has a greatest common factor.

2. The GCF is 12. The LCM is $3 \times 3 \times 2 \times 2 \times 5 \times 7 = 1260$.



3. Multiples of a number are found by multiplying that number by any whole number. Because there are an infinite number of whole numbers, there can be an infinite number of multiples.



Answers to Practice Problems – Lesson 5

Set A

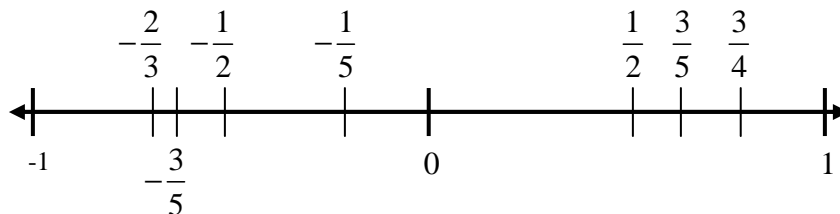
1. a) Choice A. $\left(\frac{2}{4}\right)$ is not equivalent to $\frac{2}{3}$

2. a) $\frac{8}{16} = \frac{1}{2}$ b) $\frac{12}{18} = \frac{2}{3}$ c) simplest form d) simplest form

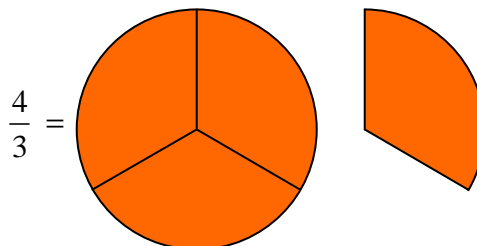
Set B

1. Just as there are an infinite number of multiples for a number, there are an infinite number of equivalent forms for any fraction. This is because you can find multiples of the numerator and denominator

2. $-\frac{2}{3}, -\frac{3}{5}, -\frac{1}{2}, -\frac{1}{5}, 0, \frac{1}{2}, \frac{3}{5}, \frac{3}{4}, 1$



3. If the numerator is greater than the denominator, the fraction is improper. It means that you have more than one whole. For example, if you had $\frac{4}{3}$ of something, you would have 1 whole of something and an extra $\frac{1}{3}$



Answers to Practice Problems – Lesson 6

Set A

1. a) $\frac{5}{7}$ b) $\frac{1}{9}$ c) $\frac{17}{20}$ d) $\frac{7}{60}$
2. a) $\frac{7}{16}$ b) $\frac{3}{4}$ c) $\frac{1}{18}$ d) $\frac{13}{25}$

Set B

1. Melissa is not right, because she added both the numerators and the denominators. To answer this problem, she must find a common denominator of the two fractions, and then she can add

them. $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$

2. $\frac{1}{2} \div \frac{1}{6} = \frac{1}{2} \times 6 = 3$. It would take 3 grapevines to fill a half-gallon bucket. Thus, it would take $3 \times 3 = 9$ grapevines to fill 3 half-gallon buckets.

3. $9 \div \frac{3}{4} = 9 \times \frac{4}{3} = 12$. There would be 12 lots. If the number of acres is doubled, the number of lots would be doubled. Thus, there would be 24 lots of land.



Answers to Practice Problems – Lesson 7

Set A

1. a) $2\frac{1}{2} = \frac{5}{2}$ b) $1\frac{7}{8} = \frac{15}{8}$ c) $4\frac{14}{15} = \frac{74}{15}$ d) $\frac{78}{3} = 26$
2. a) $2\frac{5}{6}$ b) $\frac{81}{10} = 8\frac{1}{10}$ c) $\frac{7}{12}$
- d) $\frac{48}{35} = 1\frac{13}{35}$ e) $\frac{553}{40} = 13\frac{33}{40}$ f) $\frac{3}{2} = 1\frac{1}{2}$

Set B

1. $3\frac{1}{4} < 3\frac{1}{2} < \frac{15}{4}$
2. $3\frac{2}{3} = \frac{11}{3}$ $\frac{11}{3} \div \frac{1}{3} = \frac{11}{3} \times 3 = 11$. No, you only have enough grapes to give to 11 aunts and uncles.
3. Usually, multiplying is easier because you do not have to find a common denominator. If a common denominator is already present, then adding is easier

Set B

1. a) 13, higher b) 7, higher c) 3, higher d) 9, higher



Answers to Practice Problems – Lesson 10

Set A

1. a) 3 b) 11.25 c) 23.5 d) 5
e) 53.01 f) 1.84 g) 3.465 h) 83.82
2. a) 50% b) 25% c) $27.\overline{27}\%$ d) 120%
e) $16.\overline{6}\%$ f) 87.5% g) 120% h) 90%
3. a) $16.\overline{6}\%$ b) $3.\overline{63}\%$ c) $90.\overline{90}\%$ d) 37.5%

Set B

1. 0, .1, 13% of 5, $\frac{2}{3}$, 1
2. a) Yes. If you save 30% that means you subtract 30% from 100%. In other words,
 $100\% - 30\% = 70\%$
- b) $\$4 \times .3 = \1.20 $\$4 \times .7 = \2.80 The juice will cost \$2.80
 $\$4 - \$1.20 = \$2.80$
- c) $\$2.80 \times .08 = .224 \approx \0.22 $\$2.80 \times 1.08 = 3.024 \approx \3.02
 $\$2.80 + \$0.22 = \$3.02$

The juice will cost \$3.02 after tax.



Answers to Practice Problems – Lesson 11

Set A

- | | | | |
|----|--------------|--------------|--------------|
| 1. | a) $x = 3$ | b) $n = 6$ | c) $z = 19$ |
| | d) $r = 108$ | e) $x = 200$ | f) $w = 8$ |
| | g) $z = -68$ | h) $y = -11$ | i) $t = -57$ |

Set B

- Let $x =$ the unknown value. $x \div 6 = 1.5$. $x = 9$
- The opposite of the square root is squaring a number. $(\sqrt{x})^2 = x$



Answers to Practice Problems – Lesson 12

Set A

- | | | | | |
|----|-------------|--|-------------|---|
| 1. | a) $5r$ | b) $5a + 3$ | c) $x + 3y$ | d) $-3h - 1$ |
| 2. | a) $x = 4$ | $6(4) + 2(4) = 32$ $24 + 8 = 32$ $32 = 32$ | b) $y = 2$ | $12(2) + 2 = 26$ $24 + 2 = 26$ $26 = 26$ |
| | c) $t = 5$ | $2 = \frac{10}{5}$ $2 = 2$ | d) $p = -1$ | $8(-1) = 7(-1) - 1$ $-8 = -7 - 1$ $-8 = -8$ |
| | e) $k = 13$ | $-2(13) - 4 = -30$ $-26 - 4 = -30$ $-30 = -30$ | | |



Answers to Practice Problems – Lesson 14

Set A

- 12 ft. = 144 in.
- 633,600 in. = 10 miles
- a) 3.8 m = .0038 km b) 4 kg = 4,000,000 mg c) 12.2 cL = .00122 hL
d) 53.3 mm = .0000533 km e) 9 g = .9 dag f) 1.6 daL = 160 dL
- a) Years b) Months c) Weeks d) Minutes or seconds e) Hours or Minutes
- a) 15 min. = 900 sec. b) 1 year = 525,600 min.
c) 175 sec. = 2 min. 55 sec. d) 1,000,000 \approx 11 days
- 15 min. = 900 sec. 7. 3 yr. = 1095 days 8. 7 yr. = 220,752,000 sec.

Set B

- Answers may vary. One method would be using shoe size to approximate. Take steps going heel to toe with your feet, and measure how many shoe lengths it would take to go from one end of the court to the other. Another method could use arm spans (fathoms).
- Answers will vary. Take your age in years, and multiply that by 31,536,000. If you want to be more precise, find out how many years and days you've been alive. Take the years, multiply that by 31,536,000. Then, multiply the days by 86,400. Lastly, add those two numbers together, and that is how many seconds you have been alive. (You could get more precise if you find out how many years, days, hours, and minutes you have been alive.)

3. Answers will vary. Take your height in inches, and multiply that by 2.5. That is your height in cm. Take your weight in pounds, and divide that by 2.2. That is your weight in kg.
4. Answers may vary. In the United States, a car's speed is measured in miles per hour. This is the rate of the distance traveled (in miles) over the time (in hours) it took for the car to travel that distance. In most other countries, a car's speed is measured in km/hr.
5. If Jesús ran the race faster than José, his time had to be less than José's, because his speed was faster than José's. Think of it this way: speed is measured as the following rate, $\text{speed} = \frac{\text{distance}}{\text{time}}$. We can rearrange this equation to solve for time: $\text{time} = \frac{\text{distance}}{\text{speed}}$.

Since both runners ran the same distance, we will let d = the distance they ran. We will also let s = the speed that José ran the race. Since Jesús was four times faster, his speed is $4s$. José's time can be represented by the following equation.

$$t = \frac{d}{s}$$

Jesús's time can be represented by this equation.

$$t' = \frac{d}{4s}$$

Thus, Jesús's time is $\frac{1}{4}$ of José's time. In other words, Jesús ran the race in $24 \times \frac{1}{4} = 6$ min.



Answers to Practice Problems – Lesson 15

Set A

1. a) $\frac{1}{2}$ b) $\frac{2}{3}$ c) $\frac{3}{8}$ d) $\frac{2}{5}$ e) 17 f) $\frac{13}{15}$
2. a) 30 mph b) 50 ft./sec. c) \$355/week d) \$11.50/hr.

Set B

1. $\frac{40 \text{ yd.}}{4.4 \text{ sec}} \left(\frac{3600 \text{ sec.}}{1 \text{ hr.}} \right) \left(\frac{1 \text{ mi.}}{1760 \text{ yd.}} \right) \approx 18.6 \text{ mph}$

2. red : white : blue = 1 : 2 : 4 = 1x : 2x : 4x $x + 2x + 4x = 175$
 $7x = 175$
 $x = 25$

There are **25** red marbles, $2(25) = \mathbf{50}$ white marbles, and $4(25) = \mathbf{100}$ blue marbles.



Answers to Practice Problems – Lesson 16

Set A

1. $b = 10$

2. $w = 99$

3. $z = 32$

4. $\frac{a + 5}{20} = \frac{a}{15}$
 $15(a + 5) = 20a$
 $15a + 75 = 20a$
 $75 = 5a$
 $15 = a$

Set B

1. $\frac{\text{length}}{\text{weight}} = \frac{8.5}{52} = \frac{10}{x}$ A 10 cm length of cable weighs **61.18 g**.
 $8.5x = 520$
 $x \approx 61.18$

2. $\frac{\text{men}}{\text{women}} = \frac{6}{5} = \frac{3600}{x}$ There are **3000 women** in the class.
 $6x = 18,000$
 $x = 3000$

3. $\frac{14 \text{ in.}}{48 \text{ hr.}} \approx .3 \text{ in./hr.}$

4. $7\frac{1}{2}$ hr. $\left(\frac{60 \text{ min.}}{1 \text{ hr.}}\right) = 450 \text{ min.}$ $\frac{450}{25} = 18$. The doctor can see **18 patients**.



Answers to Practice Problems – Lesson 17

Set A

- a) Acute angle b) Right angle c) Obtuse angle d) Straight angle
- In the diagram, $l \parallel m$, $k \perp m$, and $k \perp l$. Vertical angles are: $\angle BDC \cong \angle GDE$,
 $\angle CDG \cong \angle BDE$, $\angle GJI \cong \angle KJL$, $\angle GJK \cong \angle IJL$, $\angle IGJ \cong \angle DGE$, $\angle DGI \cong \angle EGJ$,
 $\angle DEG \cong \angle AEF$, $\angle DEA \cong \angle GEF$

Set B

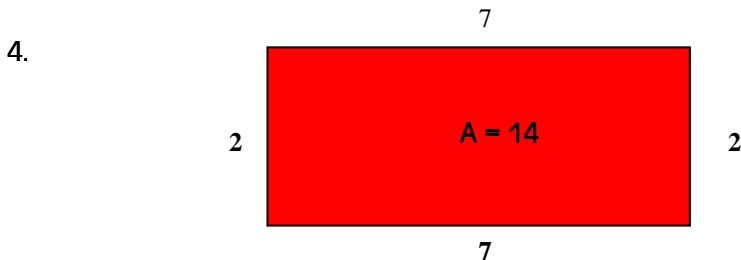
- Answers will vary.



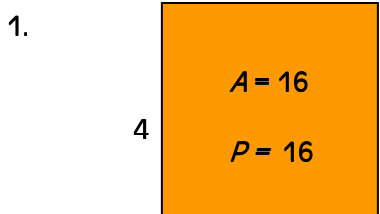
Answers to Practice Problems – Lesson 18

Set A

- a) True b) False c) True d) True e) True
- a) Polygon, quadrilateral, parallelogram, rhombus, rectangle, and square
b) Polygon, quadrilateral, trapezoid, and isosceles trapezoid
- a) Perimeter = 44 units Area = 121 square units
b) Perimeter = 30 units Area = 50 square units
c) Perimeter = 32 units Area = 45 square units
d) Perimeter = 24 units Area = 24 square units



Set B



$P = 4s$ We want area and perimeter to be equal ($P = A$).

$A = s^2$ So, we will substitute for P and A . $\frac{4s}{4} = \frac{s^2}{s}$

$$4 = s$$

2. The **base is 10** and **height is 5**

$A = bh$ If the base is twice the height,
 $b = 2h$ then $b = 2h$. So, we will
 substitute $2h$ for b in the area
 formula, and 50 for A .

$$50 = (2h)h$$

$$\frac{50}{2} = \frac{2h^2}{2}$$

$$\sqrt{25} = \sqrt{h^2}$$

$$5 = h$$

$$10 = 2h = b$$

3. $\frac{16}{x} = \frac{x}{25}$ The area of the smaller rectangle is 320 mm^2 , and the area of the larger
 $\sqrt{400} = \sqrt{x^2}$ rectangle is 500 mm^2 .

$$20 = x$$



Answers to Practice Problems – Lesson 19

Set A

1. a) The missing angles are both 45° . It is a right, isosceles triangle.
 b) The missing angle is 33° . It is an acute, scalene triangle.

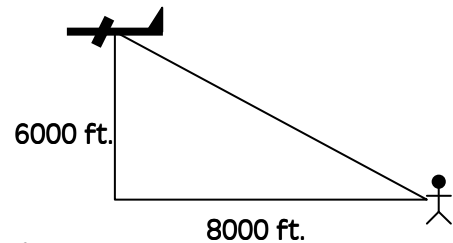
2. a) No b) Yes, obtuse c) No
 d) Yes, right e) Yes, obtuse f) Yes, right

Set B

1. You cannot create a right equilateral triangle ($3 \times 90^\circ = 270^\circ$). Each angle in an equilateral triangle is 60° ($3 \times 60^\circ = 180^\circ$).
2. True. The right angle is 90° . Since the three angles must sum to 180° , and $180^\circ - 90^\circ = 90^\circ$, the other two angles have to add up 90° . This is the definition of complementary angles.

3. $6^2 + 8^2 = 36 + 64 = 100$ Use Pythagorean Theorem
 $\sqrt{100} = 10$ $a^2 + b^2 = c^2$

Add three zeros. Dominick is **10,000 ft.** from the plane.



This is the method without using mental math. Notice the answer is the same.

$$6000^2 + 8000^2 = 36,000,000 + 64,000,000 = 100,000,000$$

$$\sqrt{100,000,000} = 10,000$$



Answers to Practice Problems – Lesson 20

Set A

1. $A = \frac{1}{2}(3)(4) = 6$ square units

2. $A = \frac{1}{2}(5)(7) = 17.5$ square units

3. $A = \frac{1}{2}(17)(15) = 127.5$ square feet

4) $10 = \frac{1}{2}(b)(4)$

$$10 = 2b$$

$$5 \text{ in.} = b$$

5) $48 = \frac{1}{2}(12)(h)$

$$48 = 6h$$

$$8 \text{ ft.} = h$$

6) 25 hm

7) 7 ft.

8) 27 mi.

Math On the Move

9) $z = 10$ mi.

10) $x = 14$ cm

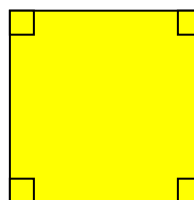
11) Each side is 26 units

12) $\frac{15}{20} = \frac{s}{3}$
 $45 = 20s$
 $2.25 = s$

13) $\frac{5}{3} = \frac{10}{s}$
 $5s = 30$
 $s = 6$

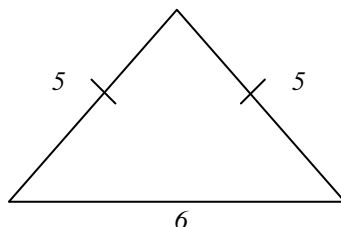
Set B

1. Answers may vary. The two quadrilaterals have right angles at each vertex, but the corresponding sides are not proportional.



2. Both proportions work. When you cross multiply you end up with the same number attached to the z , and the same number on the other side of the equal sign. The solution is $z = 29.75$

3. Add up all the sides and set that equal to the perimeter. $x + x + x + 1 = 16$



$$3x + 1 = 16$$

$$3x = 15$$

$$x = 5$$



Answers to Practice Problems – Lesson 21

Set A

1. a) \overline{AB} b) \overline{OA} , \overline{OB} , \overline{OC} , and \overline{OD}

2. a) 12 mm b) 6 mm

3. a) Area = $9\pi \text{ km}^2 \approx 28.3 \text{ km}^2$ Circumference = $6\pi \text{ km} \approx 18.8 \text{ km}$
 b) Area = $12.25\pi \text{ sq. in.} \approx 38.5 \text{ sq. in.}$ Circumference = $7\pi \text{ in.} \approx 22.0 \text{ in.}$
4. Danny did not square 10, he doubled it. He also forgot to include the units. The actual area of the circle is $100\pi \text{ m}^2 \approx 314 \text{ m}^2$.

Set B

1. The area of the whole pizza is $36\pi \approx 113.04 \text{ sq. in.}$
 So, the area of one slice is $113.04 \div 8 = 14.13 \text{ sq. in.}$
2. To find the area of the shaded ring, find the area of the larger circle and subtract the area of the smaller circle. $9^2\pi - 6^2\pi = 81\pi - 36\pi \approx 141.3 \text{ square units}$

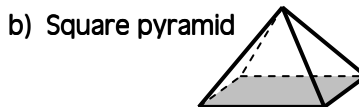


Answers to Practice Problems – Lesson 22

Set A

1. Prisms and cylinders have two bases.
2. The length of all the edges of a cube are the same. (the length, width, and height are all the same).
3. a) $8 \times 11 \times 5.5 = 484 \text{ ft.}^3$ b) $\left(\frac{1}{2} \times 8 \times 5\right) \times 2 = 40 \text{ m}^3$
 c) $\frac{1}{3}(10^2\pi)30 \approx 3140 \text{ mm}^3$ d) $\frac{1}{3}\left(\frac{1}{2} \times 12 \times 18\right)32 = 1152 \text{ cm}^3$

Set B



2. A sphere has no base.

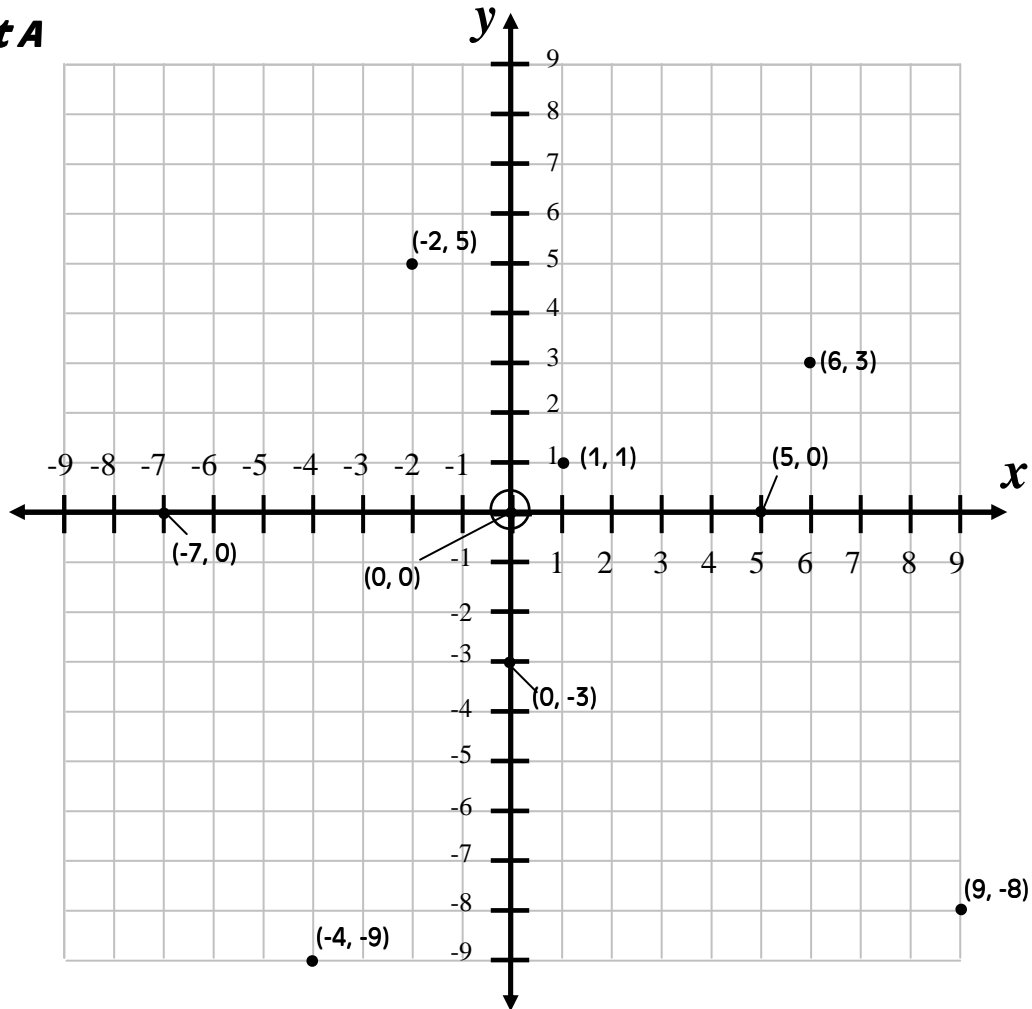
3. The length of the edge is 4. $4 \times 4 \times 4 = 64$



Answers to Practice Problems – Lesson 23

Set A

1.



2. a) slope = $-\frac{1}{6}$ y-intercept = 7
b) slope = $\frac{3}{2}$ y-intercept = 2
c) slope = $-\frac{1}{2}$ y-intercept = -6
d) slope = 0 y-intercept = -8.5

Set B

1. A vertical line has no "run". In other words the "run" is zero. We cannot divide a number by zero, so a vertical line is undefined.



Answers to Practice Problems – Lesson 24

Set A

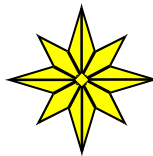
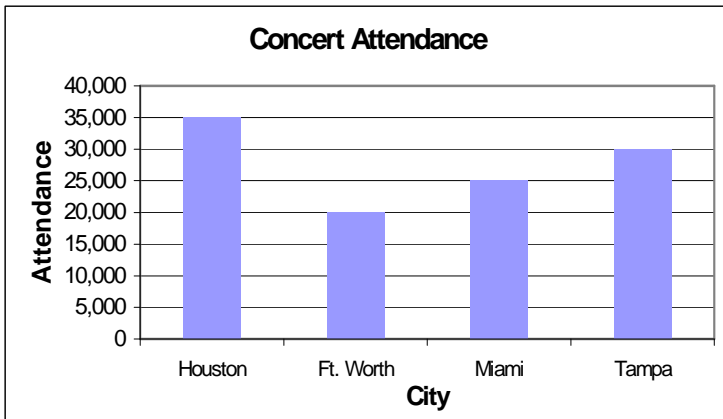
1. a) 800,000 b) 900,000
c) The biggest decrease occurred between the 1950s and 1960s.

2. a) The minimum wage in 1978 was approximately \$2.60.
b) The minimum wage was above \$5 in 1998 and the years following.
c) The minimum wage was below \$1 in years preceding 1958.

Set B

1. We use graphs to represent data, because it is an easy way to condense, visualize, and compare data.

2.



End of Answers to Practice Problems