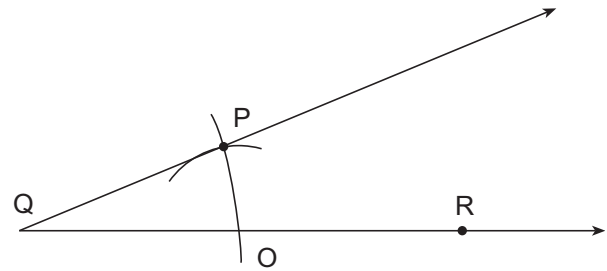
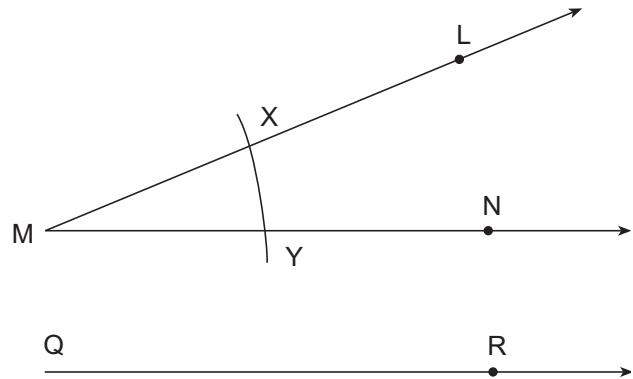




### Constructing Congruent Angles

You can construct an angle congruent to  $\angle LMN$  without using a protractor. To do this, you will need a compass and a straightedge.

- With the straightedge, draw ray QR.
- Using point M as the center, draw an arc that intersects both rays of  $\angle LMN$ . Label the intersection points X and Y.
- Using point Q as the center, draw the same arc on ray QR. Label the point of intersection O.
- Open the compass points just far enough to place them on points X and Y.
- Using point O as the center, draw an arc that intersects the first arc you drew. Label the point of intersection P.
- Use your straightedge to draw ray QP.



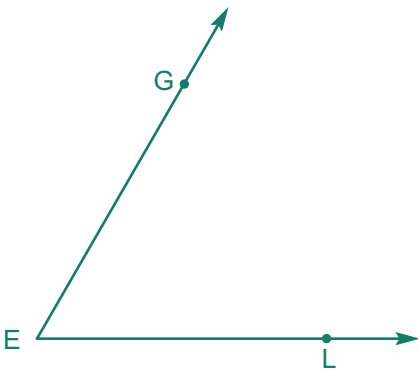
$$\angle PQR \cong \angle LMN$$

Angle PQR is congruent to angle LMN.

$\cong$  congruent  
 $\sim$  similar

Use a compass and a straightedge to construct  $\angle JAM$  congruent to  $\angle GEL$ .

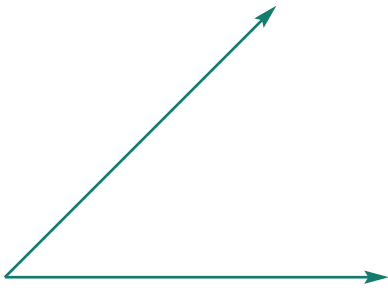
$\triangle 1.$



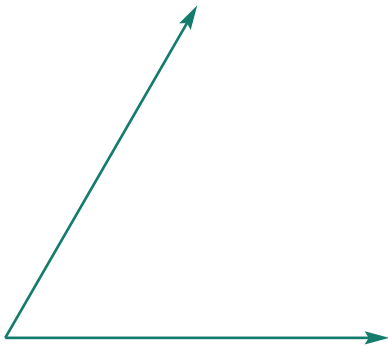
## Lesson 2

Use a compass and a straightedge to copy each angle in the space to the right.

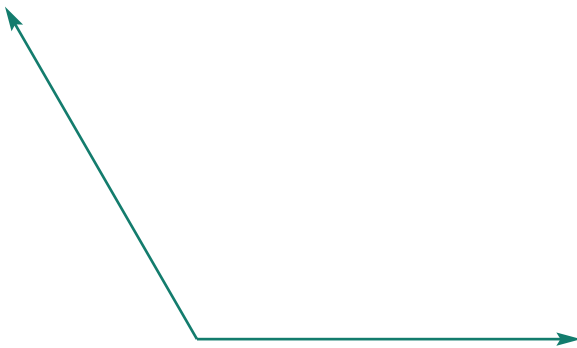
△ 2.



△ 3.



△ 4.



*We Remember*

Simplify.

5. a.  $x^2 \cdot 3x^2$

b.  $5a^2 \cdot a^2 \cdot 2b$

c.  $3y^2 \cdot 8y$

d.  $x^2 + 3x^2$

**Beware!**  
Multiplying variables  
is not the same  
as adding  
variables.

Find each square.

6. a.  $(0.08)^2 =$  \_\_\_\_\_

b.  $(\frac{7}{8})^2 =$  \_\_\_\_\_

— **+** **x** Skill Builders —

$$7\frac{1}{12}$$

$$6\frac{1}{3}$$

7. a. 
$$\begin{array}{r} 1' 11'' \\ \times \quad 8'' \\ \hline \end{array}$$

Write the remainder with *R*.

b. 
$$289 \overline{) 145,504}$$

c. 
$$+ 4\frac{3}{4}$$

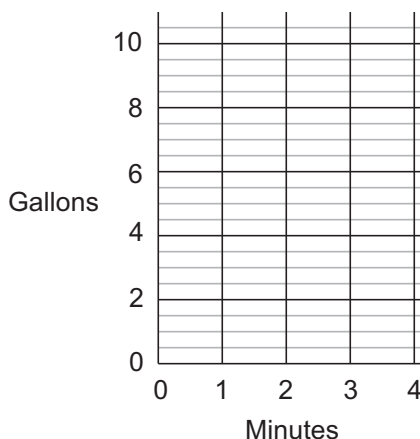
Find the profit or loss. Use parentheses to show a loss.

8. Sales \$49; expenses \$34  
profit (loss) \_\_\_\_\_

Finish the table of values, plot the points on the graph, and draw the line for the linear relation.

9. The high-pressure washer uses 2.5 gallons of water per minute.

Minutes	Gallons
1	
2	
3	
4	



Choose the correct equation for the problem. Solve.

Steve found that the skid-steer loader was operated 16 hours more than  $\frac{1}{8}$  of the present hour reading since it was last serviced. If the present hour reading is 1,296 hours, how many hours was the loader operated since it was serviced?

$$h = 1,296 \div 8 + 16$$

$$h = (1,296 + 16) \div 8$$

$$h + 16 = 1,296 \div 8$$

10. a. Equation: \_\_\_\_\_

b. Answer: \_\_\_\_\_

Use the chart on page 3. Round irrational roots to the nearest tenth. Then simplify.

11. a.  $\sqrt{2} + \sqrt{22}$

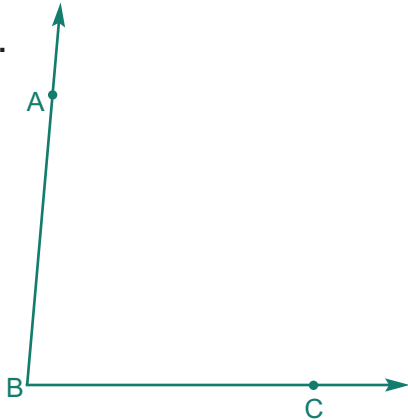
b.  $\sqrt{36} - \sqrt{21}$

c.  $\sqrt{27} + \sqrt{17} - \sqrt{7}$



Use a compass and a straightedge to construct an angle congruent to  $\angle ABC$ .

△ 24.



## Lesson

# 3



## Probability With More Than Two Options

So far we have looked at probabilities which used two options, such as a black or a white marble, or a germinating or non-germinating seed. However, probabilities often involve more than two options.

Suppose a gumball machine holds 42 red, 30 blue, 15 white, and 10 orange gumballs. You like orange gumballs best. What is the probability that you will get your favorite kind if you put your nickel in?

Remember: the numerator of the probability ratio is the number of favorable outcomes (orange in this case). The denominator of the ratio is the total number of possibilities.

**42 red + 30 blue + 15 white + 10 orange = 97 total outcomes in this problem.**

$$\frac{10 \text{ favorable outcomes}}{97 \text{ total outcomes}}$$

The probability ratio for getting an orange gumball is  $\frac{10}{97}$ .

**Find the probability ratios. Reduce to simplest form.**

- Rose has a candy bowl containing 12 red, 5 orange, 14 green, and 11 yellow candies.

What is the probability of randomly selecting a red candy from the bowl? \_\_\_\_\_

### Lesson 3

2. Randal has a jar of pennies with different dates.

Six are from 1982, 7 from 1990, 3 from 1983, and 5 from 1979. When he reaches into the jar, what is the probability that he will pull out a penny from 1980?

\_\_\_\_\_

3. Randal and Steve are playing a board game using a spinner. The spinner has five different sections numbered 1, 2, 3, 4, and 5. What is the probability of spinning a 2? \_\_\_\_\_



#### Probability and Decisions

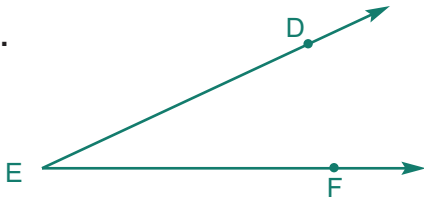
Probabilities can help us make wise decisions. Suppose you like orange gumballs best, but you also enjoy most of the other flavors. If you get a red gumball, you might be disappointed, but you could still enjoy the red gumball. However, if you cannot enjoy any flavor besides orange, you would have wasted your nickel on the red gumball. It is not wise for you to take a chance on the orange gumball if it means you would waste your money. A nickel seems rather insignificant. However, this principle sometimes involves millions of dollars. It is important to follow God's principles so you can make wise decisions when the costs are large.



### We Remember

Use a compass and a straightedge to construct an angle congruent to  $\angle DEF$ .

△ 4.



Write the products. Use fractions for those with negative exponents.

5. a.  $6^1 =$  \_\_\_\_\_

b.  $7^0 =$  \_\_\_\_\_

c.  $2^{-6} =$  \_\_\_\_\_

d.  $13^{-2} =$  \_\_\_\_\_

Translate the phrases into equations. Use  $n$  for the variable.

6. Ten more than half of a number is fifty. \_\_\_\_\_

7. A number less twenty is negative nine. \_\_\_\_\_

8. The sum of a number and six is eleven. \_\_\_\_\_

9. The product of ten and a number, combined with negative two, is one. \_\_\_\_\_

**Mastery Drill**

10. a. 1 gallon = \_\_\_\_\_ fluid ounces      b. 1 pint = \_\_\_\_\_ fluid ounces
11. The two shorter sides of a right triangle are called \_\_\_\_\_.
12. The *less than or equal to* symbol is \_\_\_\_\_.
13. a. Another name for average is \_\_\_\_\_.      b. The distance formula is \_\_\_\_\_.
14. a. *Deci* means \_\_\_\_\_.      b. *Hecto* means \_\_\_\_\_.      c. *Kilo* means \_\_\_\_\_.
15. a.  $\frac{3}{8} =$  \_\_\_\_\_%      b.  $3^3 =$  \_\_\_\_\_      c.  $2^3 =$  \_\_\_\_\_      d.  $\sqrt{225} =$  \_\_\_\_\_

Use the chart on page 3. Round the square roots to the nearest tenth. Simplify.

16. a.  $\sqrt{5} + \sqrt{18}$       b.  $\sqrt{25} - \sqrt{15}$       c.  $\sqrt{27} + \sqrt{14} - \sqrt{9}$



Use the Pythagorean Theorem to determine if the triangles are right triangles.

Answer *yes* or *no*.



17. a. Right triangle? \_\_\_\_\_      b. Right triangle? \_\_\_\_\_

List the prime factors with exponents. List each factor with the largest exponent. Find the LCM.

18. a.  $90 =$  \_\_\_\_\_  
 b.  $45 =$  \_\_\_\_\_  
 c.  $36 =$  \_\_\_\_\_  
 } d. \_\_\_\_\_      e. LCM = \_\_\_\_\_



Find the percent of increase or decrease to the nearest percent.

19. A change from 88 to 74 is a decrease of \_\_\_\_\_%.
20. A change from 35 to 38 is an increase of \_\_\_\_\_%.

**Lesson 3**

**$\pm$  Skill Builders**

21. a.  $\frac{x}{20} + 12 = 21$       b.  $\frac{8 \text{ hr } 40 \text{ min}}{+ 4 \text{ hr } 45 \text{ min}}$       c.  $3\frac{3}{4} \div \frac{5}{16} = \underline{\hspace{2cm}}$

**Solve.**

22. \$50 borrowed at 11% interest for 6 months.

- a. Amount of interest owed: \_\_\_\_\_  
b. Total amount to repay: \_\_\_\_\_

**Simplify.**

23. a.  $5b^2 \cdot 5c^2$       b.  $3z + 3z$       c.  $3z \cdot 3z$       d.  $x^3 \cdot 2y \cdot 3y^2$



24. Walter drove the backhoe from the job site to his home one Friday evening. He wanted to dig a ditch on Saturday to install a frost-free hydrant at the horse barn. It took 15 minutes to drive the 4.5 miles between the job site and his home. What was his average speed per hour? \_\_\_\_\_



25. When the hour meter on the excavator stopped working, Steve ordered one from the local auto-parts supply house. At \$24.99 plus 5% sales tax, what was the total cost for the new meter?  
\_\_\_\_\_

**Solve.**

26. a.  $5 \times -3 = \underline{\hspace{2cm}}$       b.  $\frac{17}{-4} = \underline{\hspace{2cm}}$       c.  $-3 \overline{)63}$

Find the mean, median, and mode. Give the mean and median to the nearest tenth.

9, 9, 5, 6, 3, 4, 6, 5, 4, 6

27. a. mean \_\_\_\_\_                      b. median \_\_\_\_\_                      c. mode \_\_\_\_\_

Convert. Round to the nearest whole.

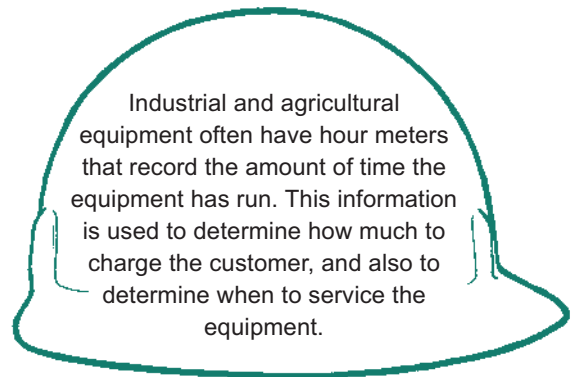
28. 25 kg  $\approx$  \_\_\_\_\_ lb

29. 50 in = \_\_\_\_\_ cm

30. 9 m  $\approx$  \_\_\_\_\_ yd

Give the probability ratio in simplest form.

31. In the pack of peanut candies Steve was eating, these colors remained: 3 yellow, 2 blue, 4 red, and 1 green. If Steve chose another candy without looking, what was the probability that he would pick a blue candy? \_\_\_\_\_



Lesson

4



Convenience Store Pricing

Why would someone pay \$1.75 for a soda from a cooler when the same soda could be purchased in larger quantities for less than \$1.00? The answer is convenience.

Convenience stores are smaller than regular grocery stores, are usually open longer hours, and often sell gasoline as well. Convenience stores have a small selection of basic items displayed close together to make it quick and easy to purchase a few items. Drinks are often placed at the back of the store so that customers need to walk past the other food items to get to the coolers. In this way stores hope to entice a person into picking up snack items that they had not previously considered buying. This type of purchase is called *impulse buying*.