

College-Ready Lesson Plan

Name _____

Course/Grade Level _____

Date _____

DOMAIN 1

Standard 1.1

Standard(s) from Instructional Guide. (List only what you plan to assess.)

AF 1.1 Write and solve linear equations

AF 2.2 Find rates and solve rate problems

MG 1.1 Formulas for circumference and area of a circle

MG 2.2 Find missing angles

College-Ready Learning Objective(s)

Students will solve three out of four problems correctly. Students will translate word problems into equations that can be solved, apply proportions to solve a problem involving rates, solve for the area of a circle, and apply supplementary angles to find a missing angle in a triangle.

What makes this lesson rigorous?

Students are gathering their own data of their individual performance on four high-priority standards during the Do Now and Domination Check. Students will be practicing word problems, one-step equations, and geometry problems in groups of 3 to 5 people. Students will apply their problem solving skills to different situations involving changes in bank accounts, rates of moving objects, and measurements of circular objects.

Measurability

Students will assess themselves on the four standards at the beginning of class (Do Now) based on a 5 level rubric. Students are familiar with the criteria for each level based on my feedback on previous assessments. Following the stations, students will again take a "CST Domination Check" to see if their scores improved from the beginning of class. Students should get 3 of the 4 problems correct.

Standard 1.2

How will the students be *cognitively* engaged?

Students will construct knowledge as they assess themselves during the Do Now and CST Domination Check. They will work together in their groups on each station to review the four high-priority standards. The teacher will act as a facilitator during the review time and will visit the groups to ensure they understand each concept.

How will the key cognitive strategies and/or how will Bloom's higher levels of cognitions and/or the college ready academic knowledge and skills and/or academic behaviors be incorporated into the lesson?

Students will be able to work collaboratively to help each other throughout the review stations. They will be writing and creating equations based on word problems, selecting and applying appropriate tools for solving the problems (example: using proportions to solve rate problems), and examining lines and angles to find missing values in geometric problems (supplementary and complementary angles).

Connections to prior learning

Students are reviewing concepts from Unit 4 (Equations and Expressions), Unit 5 (Ratios and Proportions), and Unit 6 (Measurement and Geometry). In December, students translated key words such as "gave, per, spent, each, gets, quotient" to help them write equations. In February, students used proportions and division to solve rate problems. In April, students learned the formula for solving for the circumference and area of a circle, as well as how to solve for missing angles.

Standard 1.3

Briefly explain the steps of the lesson.

10 min Do Now: Students will solve four problems (one for each standard). See attached problems. Teacher will review answers while students correct and evaluate their performance on each problem.

5 min Students correct their homework and reflect on what they did well and where they need to improve.

2 min Teacher briefly explains stations and student expectations.

90 min Students work on 6 stations (15 minutes each) with their group. Teacher facilitates, keeps timer, visits each group.

10 min Students complete the CST Domination Check

3 min Students evaluate their answers for the Domination Check.

Standard 1.4

How has student data informed your selection of these objectives?

The following students from Period 4 have struggled with Writing and Solving Equations on previous assessments (1/14):

The following students from Period 4 have struggled with Rates on previous assessments (3/18):

The following students from Period 4 have struggled with Finding Missing Angles (4/15):

The following students from Period 4 have struggled with Circles (4/15):

(I will focus on these students when they are working on the stations in which they are struggling)

See attached highlighted grades for each individual student's scores.

How will the lesson be differentiated to meet the needs of advanced learners, students with special needs, struggling learners, and English Learners?

The students listed above will receive extra help from me and will be able to collaborate with advanced learners to increase their understanding in the standards addressed in the lesson. There will also be helpful hint papers in each station (concept maps or explanations on how to solve problems). Advanced learners will have additional problems if their group finishes early.

Rates: pg.571 (#s 107- 113 odd)

Writing Equations: pg.574 (#s 1-9 odd)

Solving Equations: pg.256-257 (#s 13-29 odd)

Finding Angles: pg.580 (#s 1-7 odd)

Classifying triangles: pg. 397 (#s 7-13 odd)

Circles: pg.581 (#s 37-47 odd)

Standard 1.5

What misconceptions do you anticipate? What strategies will you use to avoid or correct these cognitive errors?

As this is a review lesson, students should begin the activities knowing complementary and supplementary angles, vertical angles, the triangle sum theorem, formulas for circumference and area of a circle, ratios, proportions, rates, writing and solving one-step equations, and how to classify triangles. However, students may not remember all of these concepts. Common misconceptions include confusing complementary and supplementary angles, confusing formulas for the circles, and forgetting to use proportions for solving rates.

During the Do Now, students will assess how much they remember from these concepts. I will review strategies to remember the difference between angles (complementary = corner/90, supplementary = straight/180), formulas for a circle (when I say C you say pi d, circle song with motions: "Step 1, find the radius, Step 2, square it, Step 3, multiply it by pi") and the key units for rates. During stations, students may use the helpful hints to guide them in solving the problems.

DOMAIN 4

Standards 4.1

How will student learning be assessed during the lesson?

Student learning will be assessed during the Do Now (try 4 problems based on lesson's standards/objectives and evaluate them), homework (evaluate and reflect on your performance of the material), stations (Teacher will monitor student learning), and CST Domination Check (try 4 problems based on lesson's standards/objectives and evaluate them). As a summative assessment, students will take the CST the following week.

How will you revise your lesson based on this assessment during the lesson?

If students are struggling with a concept, I will reteach the content (I Do) and give them a few practice problems to try together and on their own.

Standard 4.2

How will student learning and progress be assessed after the lesson or at the end of the unit?

Students will be assessed during Do Nows, exit slips (ie: CST Domination Check), on the CST, and in a final project in which they will create and solve problems for 10 of the standards (including the four from this lesson).

What is the Bloom's level of assessment?

They will be *writing* and *creating (synthesis)* equations based on word problems, *selecting (analysis)* and *applying* appropriate tools for solving the problems (example: using proportions to solve rate problems), and examining lines and angles to find missing values in geometric problems (supplementary and complementary angles).

What opportunities will students have to reflect on and assess their own work?

Students will reflect and assess their work during the Do Now, stations, and CST Domination Check.

What opportunities will students have to revise and resubmit their work?

Students are able to revise their Do Now, station work, and CST Domination Check. No academic grades will be given on this lesson.

Entrance Slip

5/13/11

AF 1.1 Equations

This month Rob added 31 songs to his playlist. Now there is a total of 54 songs. Write and solve an equation to find how many songs were in his playlist last month.

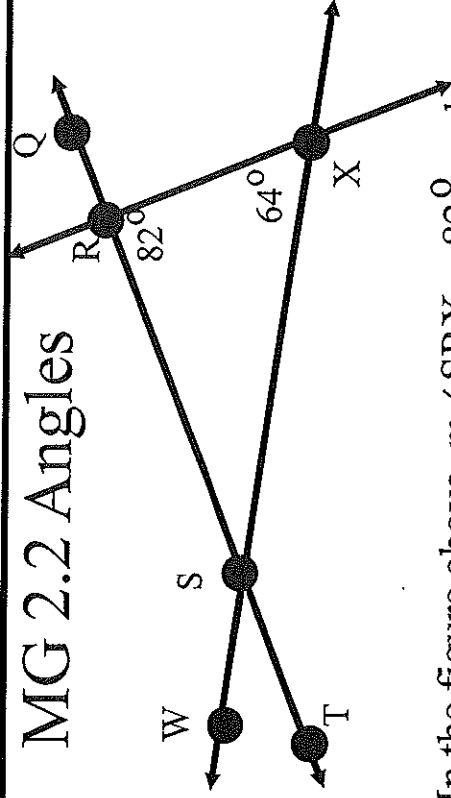
AF 2.2 Rates

A factory makes 60 toys in 8 minutes. What is the manufacturing rate in toys per minute?

MG 1.1 Circles

Write an equation that could be used to find the area in square inches of a circle with a radius of 28 inches.

MG 2.2 Angles



In the figure above, $m\angle SRX = 82^\circ$ and $m\angle RXX = 64^\circ$. What is $m\angle WST$?

Stations:

Problems in a Hat
AF 1.1

Mix Match Rates
AF 2.2

Tri Tri-naming
MG 2.3

Shady Aftermath
AF 1.1

Understanding Pi
MG 1.1

Having Fun with Angles
MG 2.2

CST Domination Check

5/13/11

AF 1.1 Equations

Justin swam the same number of laps each day for 9 days. He swam a total of 75 laps. Write and solve an equation to find the number of laps Justin swam each day.

AF 2.2 Rates

In her last 4 soccer practices, Mary ran a total of 15 miles. At that rate, how many miles will she run in 10 practices?

MG 1.1 Circles

A circular arena has a radius of 128 feet. Write an expression you can use to find the distance around the arena in feet.

MG 2.2 Angles

What is the complement of a 85° angle?



California Standards Measurement and Geometry 2.3

Draw quadrilaterals and triangles from given information about them (e.g., a quadrilateral having equal sides but no right angles, a right isosceles triangle).

Drawing Triangles and Quadrilaterals

Classifying Triangles by Angle Measures		
<p>An acute triangle has three acute angles.</p>	<p>A right triangle has one right angle.</p>	<p>An obtuse triangle has one obtuse angle.</p>

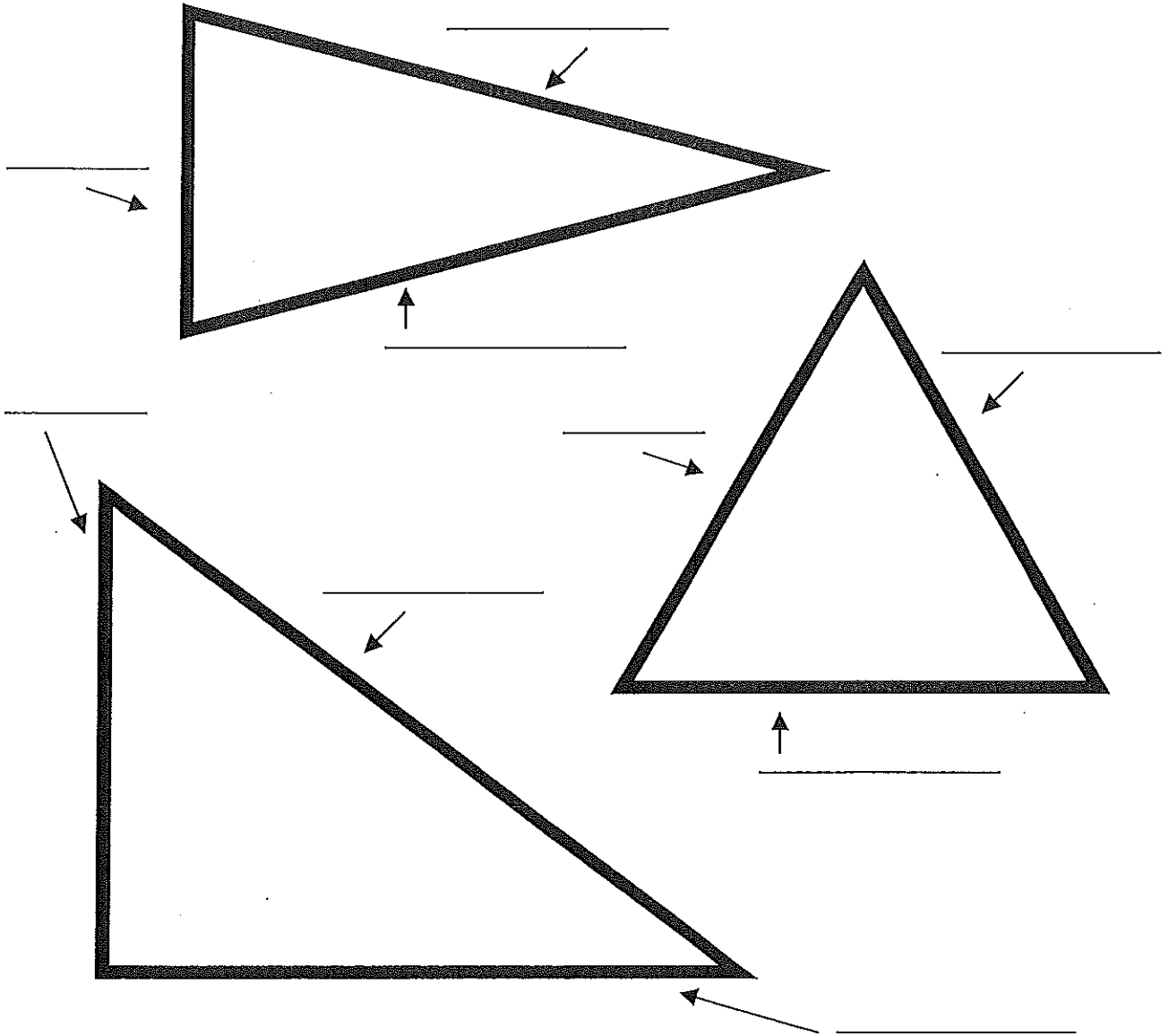
Classifying Triangles by Side Lengths		
<p>An equilateral triangle has three congruent sides.</p>	<p>An isosceles triangle has at least two congruent sides.</p>	<p>A scalene triangle has no congruent sides.</p>

Special Quadrilaterals		
<p>A quadrilateral is a polygon with four sides.</p>	<p>A trapezoid is a quadrilateral with exactly one pair of parallel sides.</p>	<p>A parallelogram is a quadrilateral with two pairs of parallel sides.</p>
<p>A rectangle is a parallelogram with four right angles.</p>	<p>A rhombus is a parallelogram with four congruent sides.</p>	<p>A square is a parallelogram with four right angles and four congruent sides.</p>

California Standards
Measurement and Geometry

Name: _____

Your Task: Measure, in inches, the sides of each triangle using a ruler. Use the lines to write in the measurements of each side.



Question: What do you notice about the three triangles?

Name

Key

Date

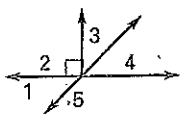


California Standards

Measurement and Geometry 2.2

Use the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving an unknown angle.

Finding Angle Measures

Terms to Know	Example
Complementary angles are two angles whose measures have a sum of 90° .	 <p>Complementary angles: $\angle 3$ and $\angle 4$ Supplementary angles: $\angle 1$ and $\angle 5$; $\angle 4$ and $\angle 5$</p>
Supplementary angles are two angles whose measures have a sum of 180° .	

Example 1 Finding an Angle Measure

If $m\angle 2 = 55^\circ$, what is $m\angle 3$?

Solution

$$m\angle 2 + m\angle 3 = 180^\circ$$

Definition of supplementary angles

$$55^\circ + m\angle 3 = 180^\circ$$

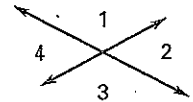
Substitute 55° for $m\angle 2$.

$$m\angle 3 = 125^\circ$$

Subtract 55° from each side.

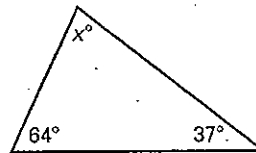
Answer $m\angle 3 = 125^\circ$

Check $55^\circ + 125^\circ = 180^\circ \checkmark$



Example 2 Finding Angle Measures in a Triangle

What is the value of x in the triangle?



Solution

$$x^\circ + 64^\circ + 37^\circ = 180^\circ$$

The sum of the angle measures in a triangle is 180° .

$$x + 101 = 180$$

Simplify.

$$x = 79$$

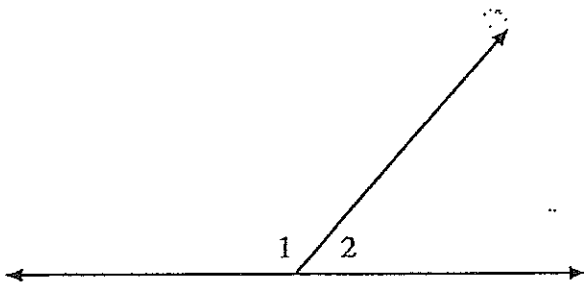
Subtract 101 from each side.

Answer The value of x is 79.

Check The sum of the three angle measures should equal 180° .

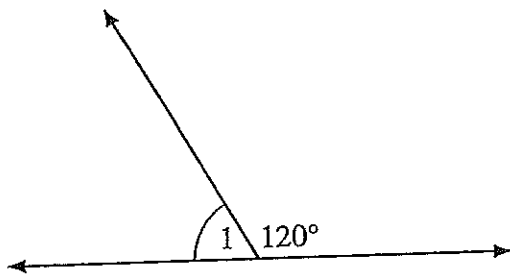
$$79^\circ + 64^\circ + 37^\circ = 180^\circ \checkmark$$

Which is a true statement about angles 1 and 2 shown below?



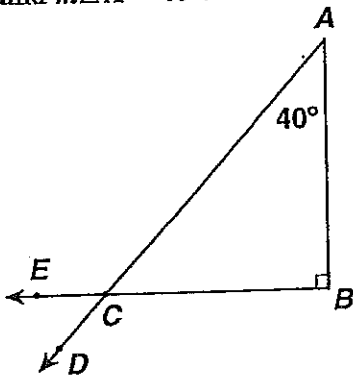
- A $\angle 1$ is complementary to $\angle 2$.
- B $\angle 1$ is supplementary to $\angle 2$.
- C Both angles are obtuse.
- D Both angles are acute.

What is the measure of angle 1 in the figure below?



- A 30°
- B 40°
- C 60°
- D 80°

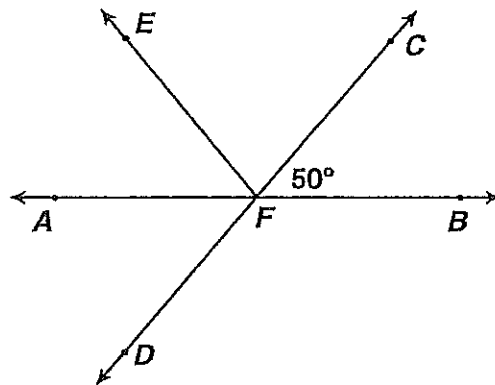
In the figure below, $\triangle ABC$ is a right triangle and $m\angle A = 40^\circ$.



What is $m\angle ECD$?

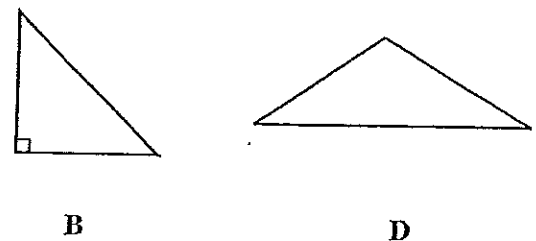
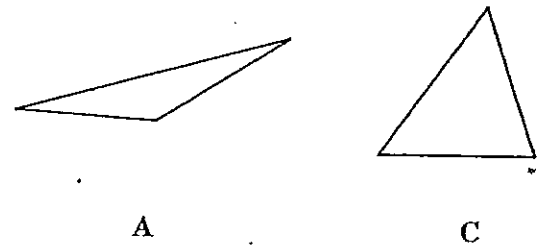
- A 40°
- B 50°
- C 130°
- D 140°

In the figure below, \overleftrightarrow{CD} intersects \overleftrightarrow{AB} at F , $m\angle CFB = 50^\circ$, and $\angle EFA \cong \angle AFD$. What is $m\angle EFC$?



- A 40°
- B 50°
- C 70°
- D 80°

Which figure is an acute triangle?



What is the supplement of a 40° angle?

- A 50°
- B 130°
- C 140°
- D 220°

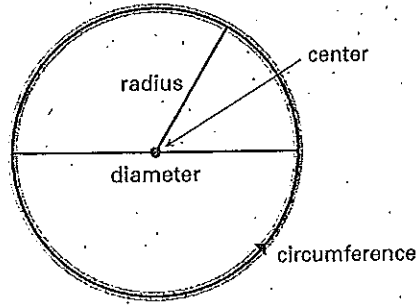
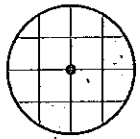


California Standards

Measurement and Geometry 1.1

Understand the concept of a constant such as π ; know the formulas for the circumference and area of a circle.

Circumference and Area of Circles

Terms to Know	Illustration
A variable is a letter that is used to represent one or more numbers.	In the expression $x + 2$, x is the <i>variable</i> .
Pi (π) is a constant that represents the ratio of the circumference of a circle to its diameter. Pi is approximately equal to 3.14 or $\frac{22}{7}$.	$\pi = \frac{\text{circumference}}{\text{diameter}} \approx \frac{22}{7} \approx 3.14$
The radius of a circle is the distance between the center and any point on the circle.	
The diameter of a circle is the distance across the circle through the center. The diameter d is twice the radius r .	
The circumference of a circle is the distance around a circle. The formulas to find the circumference C are $C = \pi d$, where d is the diameter, and $C = 2\pi r$, where r is the radius.	
The area of a circle is the number of square units needed to cover the inside of the circle. The formula to find the area A of a circle is $A = \pi r^2$, where r is the radius.	 <p>The radius of the circle is 2. The <i>area</i> of the circle is $A = \pi r^2$ $\approx 3.14(2)^2$ $= 12.56$ square units.</p>

California Standards
Measurement and Geometry

Example 1

Finding Circumference

The radius of a quarter is 1.2 centimeters. Write an expression you could use to find the circumference of a quarter in centimeters.

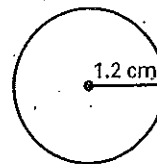
Solution

Because you know the radius, use the formula $C = 2\pi r$.

$C = 2\pi r$ Write the formula for circumference.

$= 2 \times \pi \times 1.2$ Substitute 1.2 for r .

Answer You can use the expression $2 \times \pi \times 1.2$ to find the circumference of a quarter in centimeters.





California Standards Algebra and Functions 2.2

Demonstrate an understanding that **rate** is a measure of one quantity per unit value of another quantity.

Rates

A **rate** is a ratio of two quantities measured in different units. A **unit rate** has a denominator of 1 unit. The three unit rates below are equivalent.

$$45 \text{ miles per hour} \quad 45 \text{ mi/h} \quad \frac{45 \text{ mi}}{1 \text{ h}}$$

Example 1 Finding a Unit Rate

A toy factory manufactures 60 wagons in 8 hours. What is the manufacturing rate in wagons per hour?

Solution

Write the ratio of wagons to hours. Then rewrite the ratio with a denominator of 1.

$$\frac{60 \text{ wagons}}{8 \text{ hours}} = \frac{60 \text{ wagons} \div 8}{8 \text{ hours} \div 8} \quad \text{Divide the numerator and denominator by 8.}$$

$$= \frac{7.5 \text{ wagons}}{1 \text{ hour}} \quad \text{Simplify.}$$

Answer The manufacturing rate is 7.5 wagons per hour.

Check Multiply the rate by the number of hours. $(7.5)(8) = 60 \checkmark$

Example 2 Solving a Rate Problem

The machine used in a local bakery can make 9 bagels in 2 minutes. How many bagels can the machine make in 120 minutes?

Solution

STEP 1 Write a proportion.

Be sure to pair *bagels* with *bagels* and *minutes* with *minutes*.

$$\frac{9}{2} = \frac{x}{120} \quad \leftarrow \begin{array}{l} \text{bagels} \\ \text{minutes} \end{array}$$

STEP 2 Solve the proportion.

$$\frac{9}{2} = \frac{x}{120} \quad \text{Write the proportion.}$$

$$9 \cdot 120 = 2 \cdot x \quad \text{Cross products property}$$

$$\frac{9 \cdot 120}{2} = \frac{2 \cdot x}{2} \quad \text{Divide each side by 2.}$$

$$540 = x \quad \text{Simplify.}$$

Answer The machine can make 540 bagels in 120 minutes.

 Practice

Directions: For Numbers 1 through 12, solve each equation for the given variable.

1. $2 + g = 7$

2. $n - 5 = 8$

3. $7y = 21$

4. $d \div 4 = 3$

5. $6m = 18$

6. $7 + h = 9$

A. $h = 2$

B. $h = 9$

C. $h = 16$

D. $h = 17$

7. $p \div 4 = 1$

8. $w \cdot 8 = 16$

9. $5x = 15$

10. $8 + s = 12$

11. $\frac{k}{5} = 4$

12. $d - 6 = 4$

A. $d = 10$

B. $d = 8$

C. $d = 5$

D. $d = 2$



California Standards

Algebra and Functions 1.1

Write and solve one-step linear equations in one variable.

Solving Equations

Example 1 Writing and Solving an Addition Equation

This year Shelly installed 25 new lockers in the gym. Now there is a total of 68 lockers. Write and solve an equation to find how many lockers were in the gym last year.

Solution

STEP 1 Write a verbal model.

Let x represent the number of lockers in the gym last year.

Number of lockers last year	+	Number of new lockers	=	Number of lockers this year
x	+	25	=	68

STEP 2 Solve the equation.

$$x + 25 = 68$$

Write the equation.

$$x + 25 - 25 = 68 - 25$$

Subtract 25 from each side.

$$x = 43$$

Simplify.

Answer There were 43 lockers last year.

Check Substitute 43 for x in the original equation. $43 + 25 = 68$ ✓

Example 2 Writing and Solving a Multiplication Equation

Roberto ran the same number of miles each day for 4 days. He ran a total of 14 miles. Write and solve an equation to find the number of miles Roberto ran each day.

Solution

STEP 1 Write a verbal model.

Let x represent the number of miles Roberto ran each day.

Number of days	×	Number of miles per day	=	Total number of miles
4	×	x	=	14

STEP 2 Solve the equation.

$$4x = 14$$

Write the equation.

$$\frac{4x}{4} = \frac{14}{4}$$

Divide each side by 4.

$$x = 3.5$$

Simplify.

Answer Roberto ran 3.5 miles each day.

Check Substitute 3.5 for x in the original equation. $4(3.5) = 14$ ✓

Name: _____

Shady Aftermath

<p>1. The Smith family had \$130 on a gift card to Jamba Juice. If they spent \$12 each day, which expression represents how much money they had after x days?</p>	<p>2. Gladys has some change in her pocket. After her friend gave her \$0.50, Gladys had \$2.10. Which equation can she use to find the original amount of money, m, she had in her pocket?</p>	<p>3. Which algebraic equation best describes the total growth (T) in height of apple trees over a 2-year period, if g equals the rate of growth in centimeters per year?</p>	<p>4. Write "14 is 9 subtracted from d" as an algebraic equation. Then find the solution.</p>
<p>5. Solve $\frac{2}{7}p = \frac{8}{21}$</p>	<p>6. Walter has a collection of trading cards. He started with 32 cards. If he gets 7 more cards each day, which expression represents how many cards Walter has after c days?</p>	<p>7. Which algebraic equation best represents the number of eggs, G, Lisa eats for breakfast in five days if she eats y eggs each day?</p>	<p>8. Marvin ate ice cream every night last week. On Saturday night, he ate $\frac{1}{3}$ of a cup of ice cream. If Marvin ate a total of $3\frac{7}{8}$ cups of ice cream, which equation can he use to find the amount of ice cream, r, he ate the rest of the week?</p>
<p>9. Which algebraic equation best describes the total length (L) in centimeters a snail crawls of over 8 hours, if h equals the rate of centimeters per hour the snail crawls?</p>	<p>10. Write "the quotient of n and 2.3 is 4.6" as an algebraic equation. Then find the solution.</p>	<p>11. Solve $\frac{8}{33}w = \frac{3}{11}$.</p>	<p>Directions: Take a problem. Find the answer on the grid. Write the number of the problem that matches the answer. Lightly shade the box where you found the answer.</p>