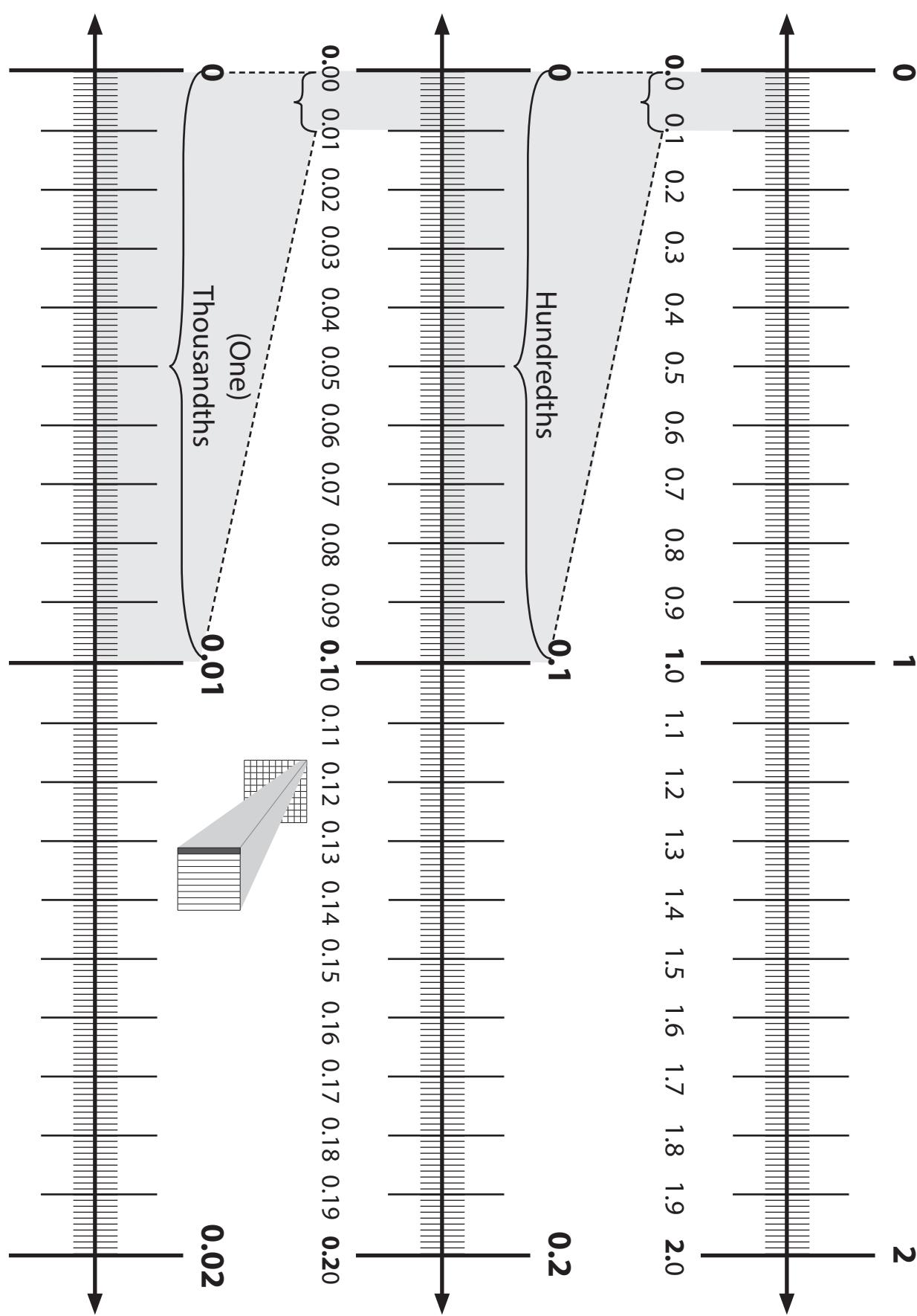


Decimal Number Lines

IA1



Part-Whole Models

Part	Whole
Part	Part

Addend	Sum
Addend	Addend

Subtrahend	Minuend
Subtrahend	Difference

$$\begin{array}{r} \text{Part} \\ + \text{Part} \\ \hline \text{Whole} \end{array}$$

$$\begin{array}{r} \text{Addend} \\ + \text{Addend} \\ \hline \text{Sum} \end{array}$$

$$\begin{array}{r} \text{Minuend} \\ - \text{Subtrahend} \\ \hline \text{Difference} \end{array}$$

$$\begin{array}{r} \text{Whole} \\ - \text{Part} \\ \hline \text{Part} \end{array}$$

$$\begin{array}{r} \text{Sum} \\ - \text{Addend} \\ \hline \text{Addend} \end{array}$$

$$\begin{array}{r} \text{Minuend} \\ - \text{Subtrahend} \\ \hline \text{Difference} \end{array}$$

Part + Part = Whole

Whole - Part = Part

Addend + Addend = Sum

Sum - Addend = Addend

Difference + Subtrahend = Minuend
Minuend - Subtrahend = Difference

Problem-Solving Plan

Read

What is the question asking you to find?

Analyze

What information is given?

Plan

What strategy can you use?

What equation can you write?

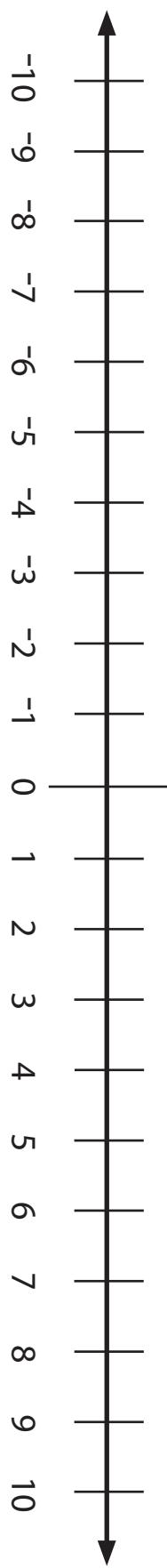
Solve

Apply your plan to solve the problem.

Check

Does your answer make sense?

Positive & Negative Number Line



Roman Numerals

IA5

Hundred Thousands ($\times 100,000$)	Ten Thousands ($\times 10,000$)	One Thousands ($\times 1,000$)	Hundreds ($\times 100$)	Tens ($\times 10$)	Ones ($\times 1$)
$\overline{\text{C}}$	$\overline{\text{X}}$	M	C	X	I
$\overline{\text{CC}}$	$\overline{\text{XX}}$	MM	CC	XX	II
$\overline{\text{CCC}}$	$\overline{\text{XXX}}$	MMM	CCC	XXX	III
$\overline{\text{CD}}$	$\overline{\text{XL}}$	$\overline{\text{IV}}$	CD	XL	IV
$\overline{\text{D}}$	$\overline{\text{L}}$	$\overline{\text{V}}$	D	L	V
$\overline{\text{DC}}$	$\overline{\text{LX}}$	$\overline{\text{VI}}$	DC	LX	VI
$\overline{\text{DCC}}$	$\overline{\text{LXX}}$	$\overline{\text{VII}}$	DCC	LXX	VII
$\overline{\text{DCCC}}$	$\overline{\text{LXXX}}$	$\overline{\text{VIII}}$	DCCC	LXXX	VIII
$\overline{\text{CM}}$	$\overline{\text{XC}}$	$\overline{\text{IX}}$	CM	XC	IX

$$\text{I} = 1 \quad \text{V} = 5 \quad \text{X} = 10 \quad \text{L} = 50 \quad \text{C} = 100 \quad \text{D} = 500 \quad \text{M} = 1,000$$

A bar over a Roman numeral multiplies the value by 1,000.

Roman Numeral Sequences

IA6

1. XXX, XXXI, XXXII, _____, XXXV, XXXVI, XXXVII, _____, _____
2. LXXIII, LXXIV, _____, _____, LXXVII, LXXVIII, _____, _____, _____
3. CCXCI, CCXCII, _____, _____, CCXCVI, CCXCVII, _____, _____
4. DCCLI, DCCLII, _____, _____, DCCLV, DCCLVI, _____, _____
5. MDCXXVI, MDCXXVII, _____, _____, MDCXXX, MCDXXXI, _____
6. MMCCCCLXV, MMCCCCLXVI, _____, _____, MMCCCLIX, _____

Number Patterns

Pattern 1: 2, 4, 6, 8, ___, ___, ___, ___

Pattern 2: 1, 1, 2, 3, 5, 8, ___, ___, ___, ___

Pattern 3: 1, 2, 4, 7, 11, 16, 22, 29, ___, ___, ___

Pattern 4: 2, 5, 11, 23, ___, ___, ___

Pattern 5: 2, 3, 5, 9, ___, ___, ___

Pattern 6: 1, 4, 13, 40, ___, ___, ___

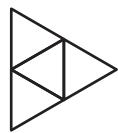
Patterns

IA8

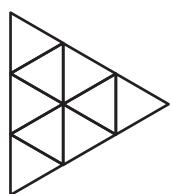
Step 1



Step 2



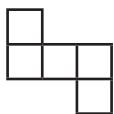
Step 3



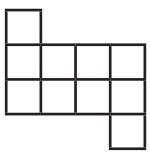
Step 1



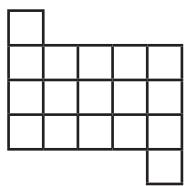
Step 2



Step 3



Step 4



Step	1	2	3	4	5	6	7	8	9
Number of □									

Cumulative Review Answer Sheet

Name _____

Fill in the circle to mark the answer.

1. (A) (B) (C) (D)

2. (A) (B) (C) (D)

3. (A) (B) (C) (D)

4. (A) (B) (C) (D)

5. (A) (B) (C) (D)

6. (A) (B) (C) (D)

7. (A) (B) (C) (D)

8. (A) (B) (C) (D)

9. (A) (B) (C) (D)

10. (A) (B) (C) (D)

11. (A) (B) (C) (D)

12. (A) (B) (C) (D)

13. (A) (B) (C) (D)

14. (A) (B) (C) (D)

15. (A) (B) (C) (D)

16. (A) (B) (C) (D)

17. (A) (B) (C) (D)

18. (A) (B) (C) (D)

19. (A) (B) (C) (D)

20. (A) (B) (C) (D)

21. (A) (B) (C) (D)

22. (A) (B) (C) (D)

23. (A) (B) (C) (D)

24. (A) (B) (C) (D)

25. (A) (B) (C) (D)

Cumulative Review Answer Sheet

Name _____

Fill in the circle to mark the answer.

1. (A) (B) (C) (D)

2. (A) (B) (C) (D)

3. (A) (B) (C) (D)

4. (A) (B) (C) (D)

5. (A) (B) (C) (D)

6. (A) (B) (C) (D)

7. (A) (B) (C) (D)

8. (A) (B) (C) (D)

9. (A) (B) (C) (D)

10. (A) (B) (C) (D)

11. (A) (B) (C) (D)

12. (A) (B) (C) (D)

13. (A) (B) (C) (D)

14. (A) (B) (C) (D)

15. (A) (B) (C) (D)

16. (A) (B) (C) (D)

17. (A) (B) (C) (D)

18. (A) (B) (C) (D)

19. (A) (B) (C) (D)

20. (A) (B) (C) (D)

21. (A) (B) (C) (D)

22. (A) (B) (C) (D)

23. (A) (B) (C) (D)

24. (A) (B) (C) (D)

25. (A) (B) (C) (D)

Apply Properties

Commutative Property

$$a + b = b + a$$
$$a \times b = b \times a$$

Associative Property

$$(a + b) + c = a + (b + c)$$
$$(a \times b) \times c = a \times (b \times c)$$

Identity Property

$$a + 0 = 0 \qquad 0 + a = 0$$
$$a \times 1 = a \qquad 1 \times a = a$$

Zero Property

$$a \times 0 = 0 \qquad 0 \times a = 0$$

Distributive Property

$$a \times (b + c) = (a \times b) + (a \times c)$$

1. $1 \times 45 = n \times 1$

2. $n + 72 = 72$

3. $16 \times 0 = n$

4. $10 \times (n \times 1) = (10 \times 7) \times 1$

5. $21 + (159 + 58) = (n + 159) + 58$

6. $50 \bullet 5 = 5 \bullet n$

7. $8 \times 14 = 8 \times (n + 4)$
 $= (8 \times n) + (8 \times 4)$
 $= 8n + 32$
 $= 112$

8. $12 \times 11 = (6 + 6) \times n$
 $= (6 \times n) + (6 \times n)$
 $= 66 + 66$
 $= 132$

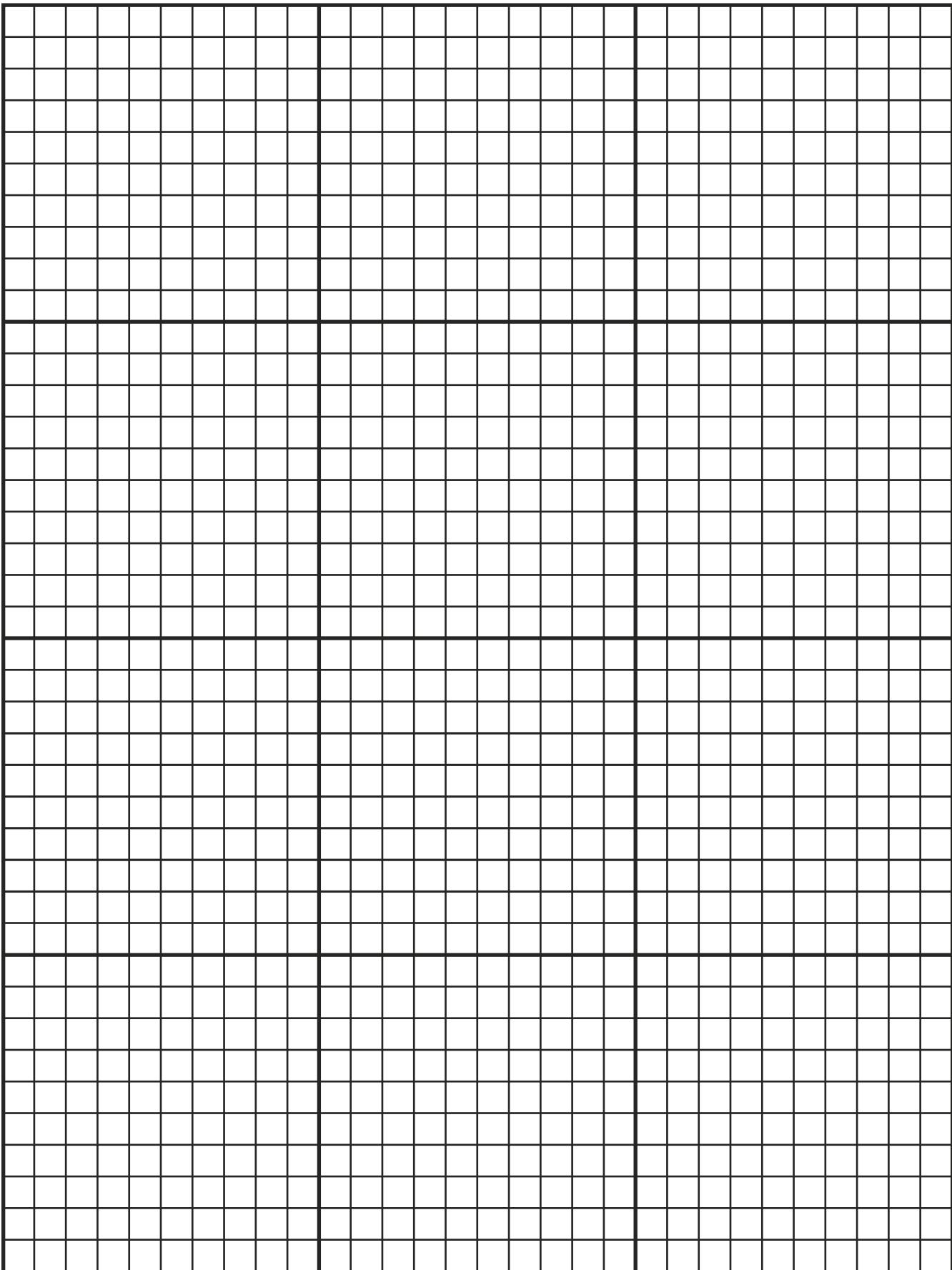
Sieve of Eratosthenes

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

Base Ten Place Value System

Place	Standard Form	Factored Form	Exponent Form
Ten Thousands	10,000	$10 \times 10 \times 10 \times 10$	10^4
Thousands	1,000	$10 \times 10 \times 10$	10^3
Hundreds	100	10×10	10^2
Tens	10	10	10^1
Ones	1	1	10^0
Tenths	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10^1}$
Hundredths	$\frac{1}{100}$	$\frac{1}{10 \times 10}$	$\frac{1}{10^2}$
Thousandsths	$\frac{1}{1,000}$	$\frac{1}{10 \times 10 \times 10}$	$\frac{1}{10^3}$
Ten Thousandsths	$\frac{1}{10,000}$	$\frac{1}{10 \times 10 \times 10 \times 10}$	$\frac{1}{10^4}$

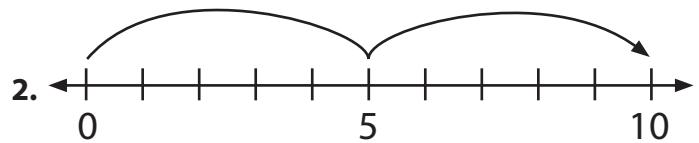
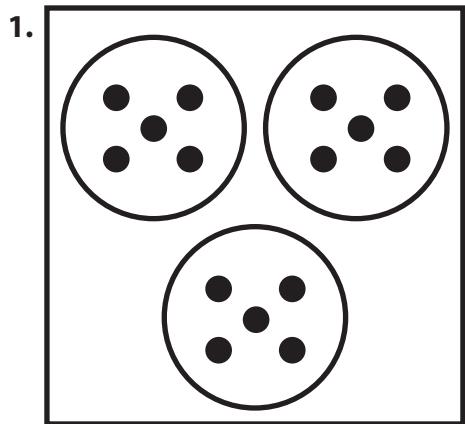
Graph Paper



Perfect Squares & Square Roots

Perfect Squares	Square Roots
$1 \times 1 = 1^2 =$	$\sqrt{1} =$
$2 \times 2 = 2^2 =$	$\sqrt{4} =$
$3 \times 3 = 3^2 =$	$\sqrt{9} =$
$4 \times 4 = 4^2 =$	$\sqrt{16} =$
$5 \times 5 = 5^2 =$	$\sqrt{25} =$
$6 \times 6 = 6^2 =$	$\sqrt{36} =$
$7 \times 7 = 7^2 =$	$\sqrt{49} =$
$8 \times 8 = 8^2 =$	$\sqrt{64} =$
$9 \times 9 = 9^2 =$	$\sqrt{81} =$
$10 \times 10 = 10^2 =$	$\sqrt{100} =$
$11 \times 11 = 11^2 =$	$\sqrt{121} =$
$12 \times 12 = 12^2 =$	$\sqrt{144} =$
$13 \times 13 = 13^2 =$	$\sqrt{169} =$
$14 \times 14 = 14^2 =$	$\sqrt{196} =$
$15 \times 15 = 15^2 =$	$\sqrt{225} =$
$16 \times 16 = 16^2 =$	$\sqrt{256} =$
$17 \times 17 = 17^2 =$	$\sqrt{289} =$
$18 \times 18 = 18^2 =$	$\sqrt{324} =$
$19 \times 19 = 19^2 =$	$\sqrt{361} =$
$20 \times 20 = 20^2 =$	$\sqrt{400} =$

Pictures of Multiplication

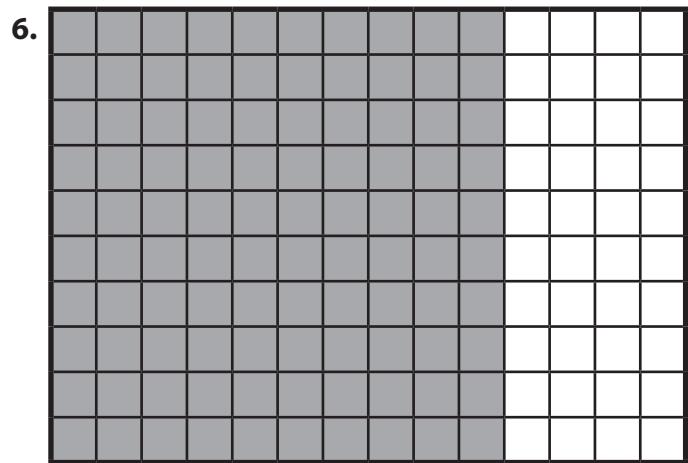
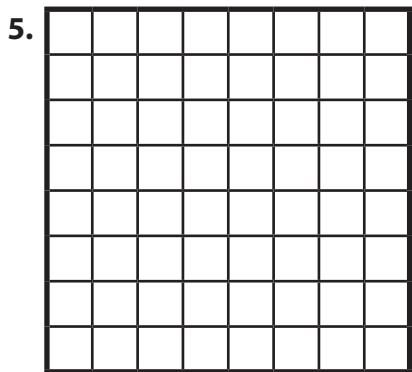


3.

n					
9	9	9	9	9	9

4.

21		
n	n	n



Short Form of Division

The *short form* of division can be used to solve division problems using mental math. Compare the steps used to solve the long form of the division problem with the steps used to solve the short form. Notice that the long division process is shown within the division frame of the short form.

$$\begin{array}{r} 1,675 \text{ r3} \\ 4) 6,703 \\ -4 \downarrow | \\ \underline{-27} \\ -24 \downarrow | \\ \underline{-30} \\ -28 \downarrow | \\ \underline{-23} \\ -20 \downarrow | \\ \underline{3} \end{array}$$

1,675 r3
4) 6,703
-4 ↓ |
-27
-24 ↓ |
-30
-28 ↓ |
-23
-20 ↓ |
3

Short Division

Divide the thousands.

Multiply and subtract mentally.

Rename the remaining thousands as hundreds.

Repeat the process for each place.

1. $8 \overline{)5, 0 \ 6 \ 2}$

2. $9 \overline{)7 \ 6 \ 8}$

3. $6 \overline{)3, 8 \ 4 \ 2}$

4. $3 \overline{)4 \ 6}$

5. $7 \overline{)9, \ 5 \ 4 \ 5}$

6. $4 \overline{)2 \ 7 \ 6}$

7. $5 \overline{)8, \ 3 \ 6 \ 2}$

8. $8 \overline{)5 \ 7 \ 9}$

9. $2 \overline{)5, \ 4 \ 0 \ 1}$

10. During a school-wide food drive, the students in grades 3, 4, and 5 collected 1,332 cans of food. The cans of food were given to 9 homeless shelters. What was the average number of cans of food that each shelter received?

Multi-Step Problems

Order of Operations

1. Do the operations in parentheses.
2. Find the value of exponents.
3. Multiply and divide from left to right.
4. Add and subtract from left to right.

1. Granddad has 36 coins and 60 paper bills from various countries. He will give an equal number of coins and bills to his 12 grandchildren. How many pieces of money will each grandchild receive?
2. Dr. Adams can see a total of 10 patients in the mornings and 8 patients in the afternoons. He can see 3 patients on Tuesday evenings and 3 patients on Thursday evenings. How many patients can he see from Monday through Friday?
3. Mrs. Frank has 3 packages of 8 red pens, 37 loose red pens, and 87 loose blue pens. How many red and blue pens does she have?

Numbers/Facts/Factors

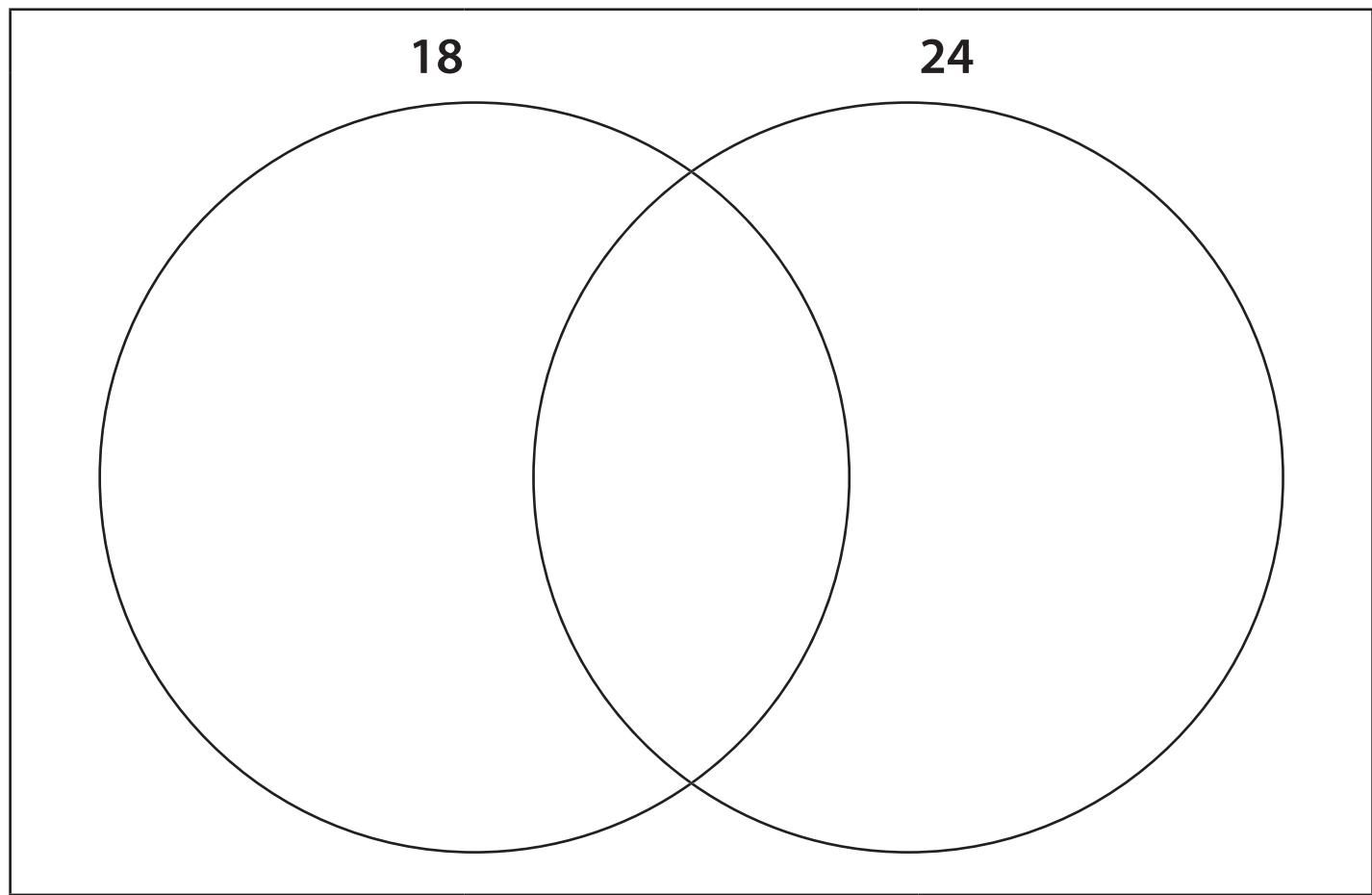
Numbers	Facts	Factors
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Venn Diagram: Factors

Factors of 18: _____

Factors of 24: _____

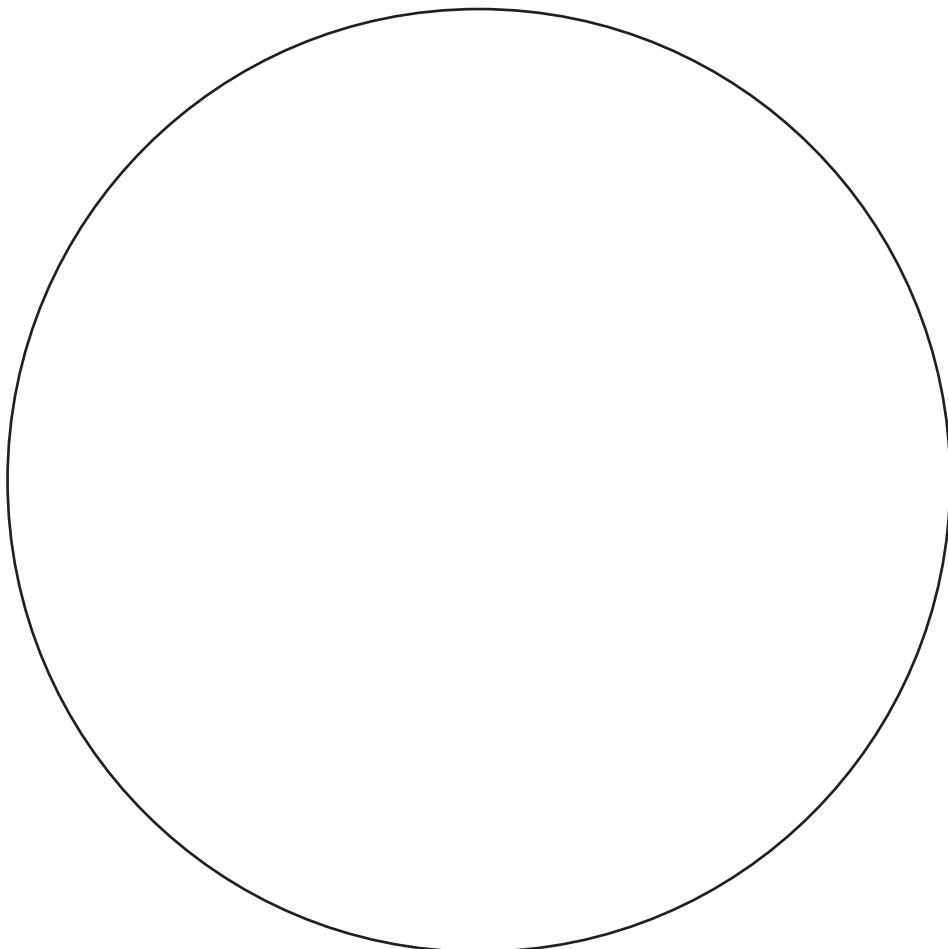
Factors of 18 and 24



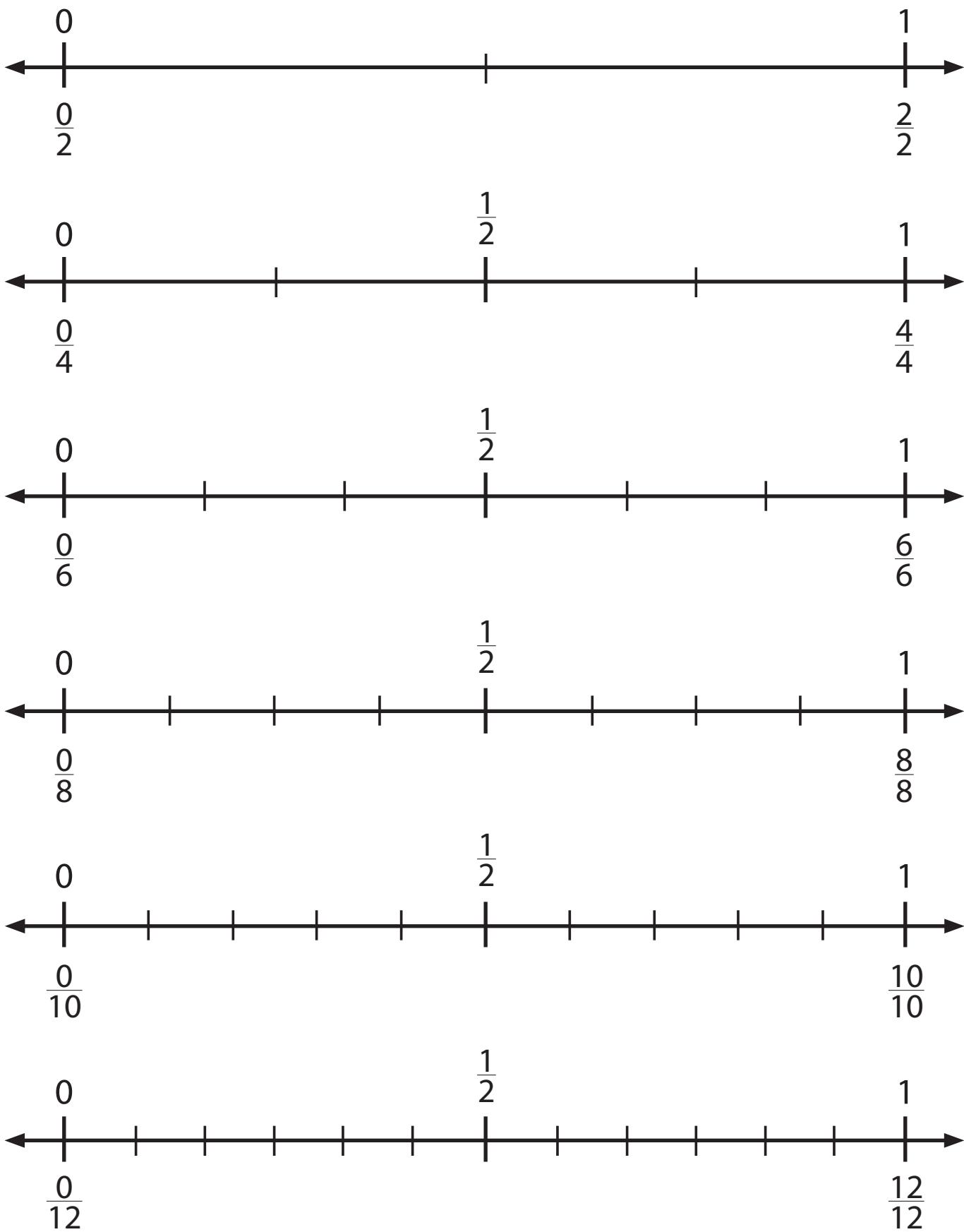
Percent Circle

IA20

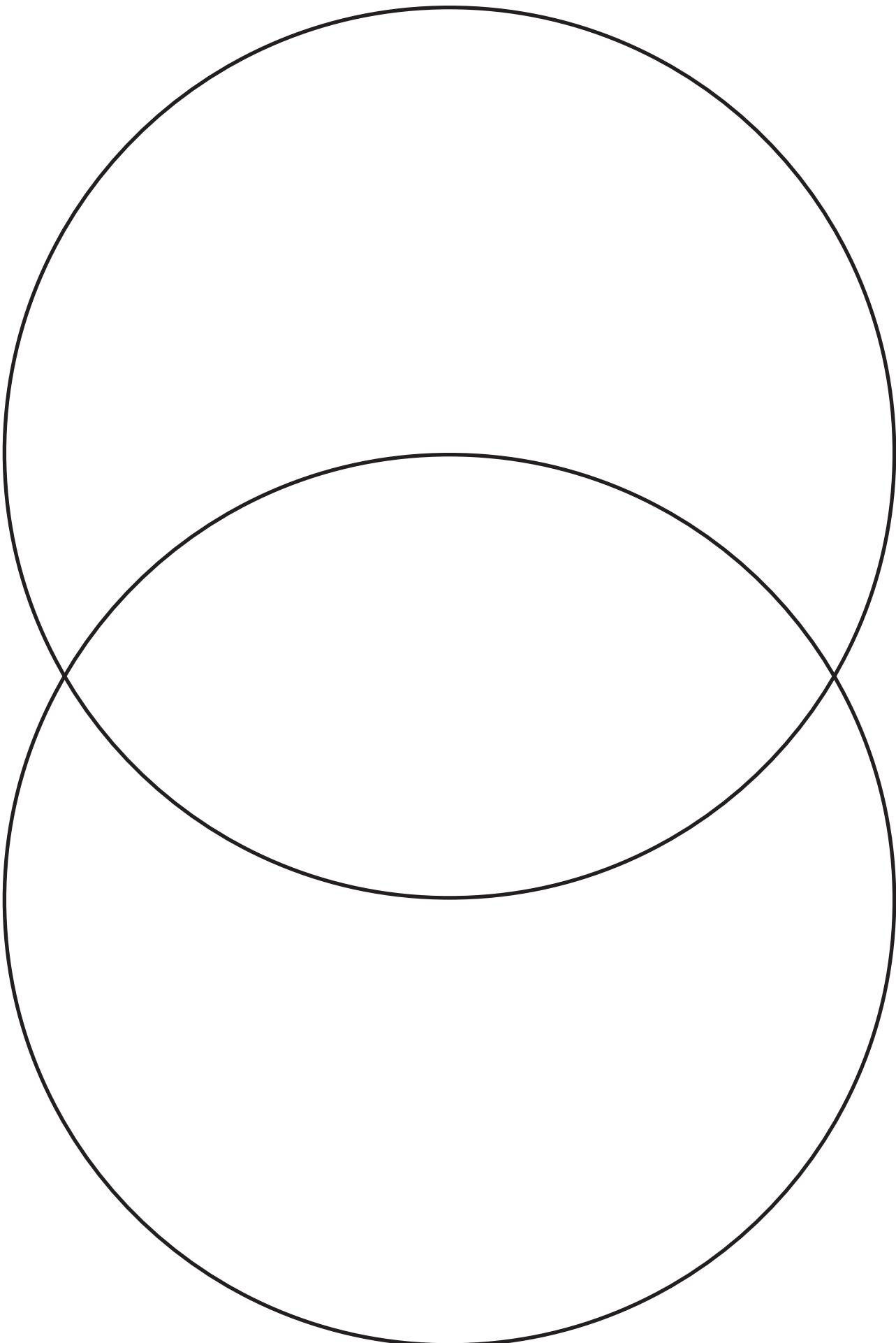
Percent	Ratio in Fraction Form	Fraction in Lowest Terms
100%	$\frac{100}{100}$	
25%	$\frac{25}{100}$	
50%	$\frac{50}{100}$	
75%	$\frac{75}{100}$	
33%	$\frac{33}{100}$	
66%	$\frac{66}{100}$	
10%	$\frac{10}{100}$	
20%	$\frac{20}{100}$	
40%	$\frac{40}{100}$	



Fraction Number Lines



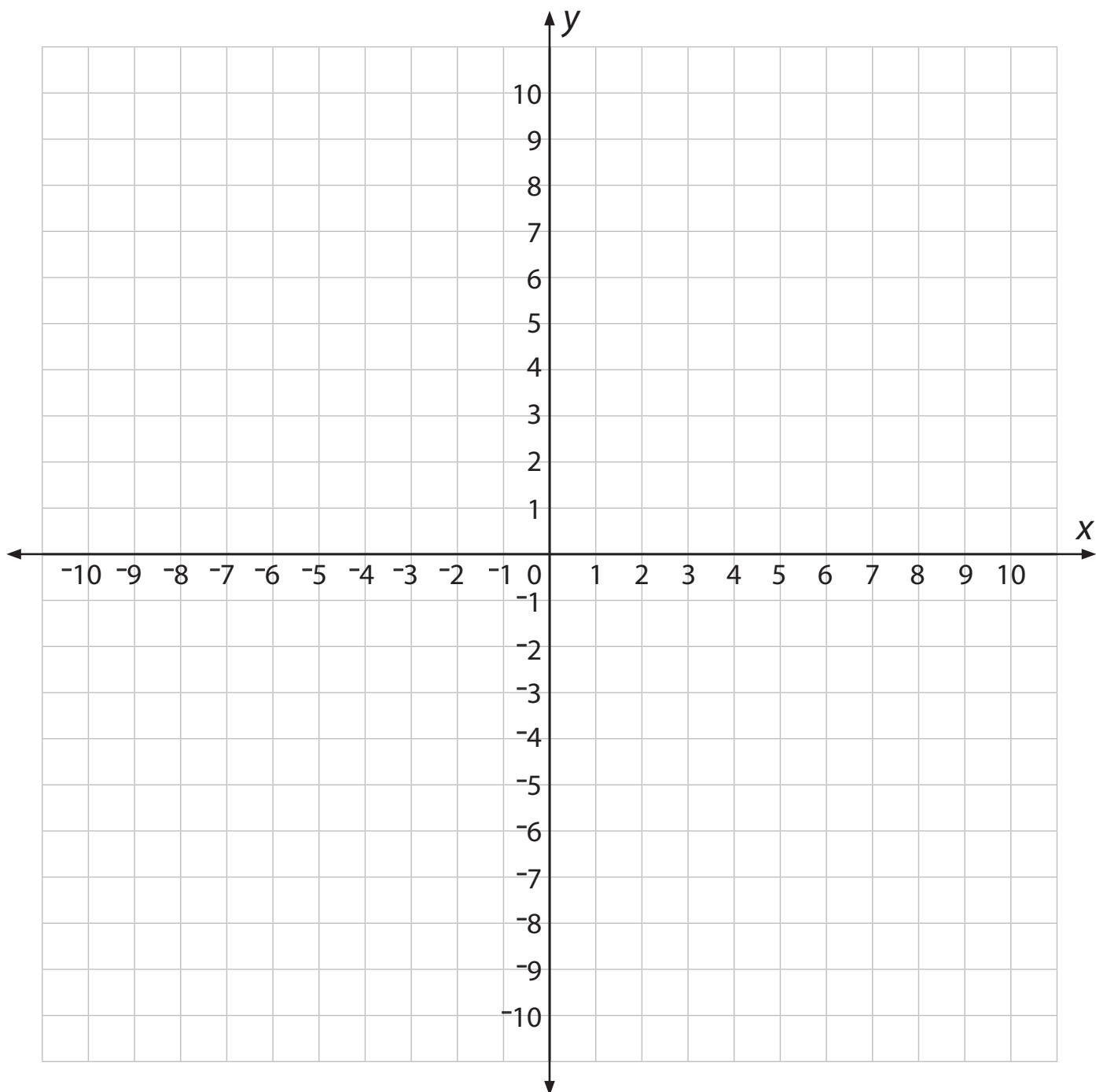
Venn Diagram



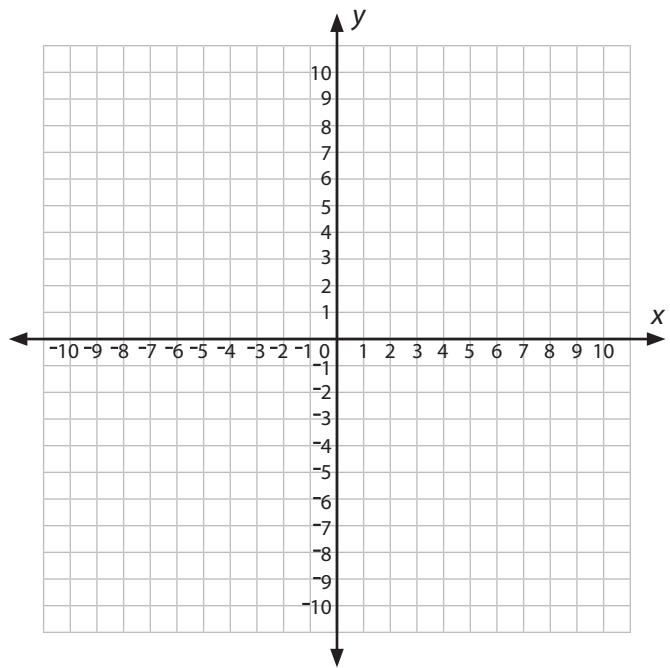
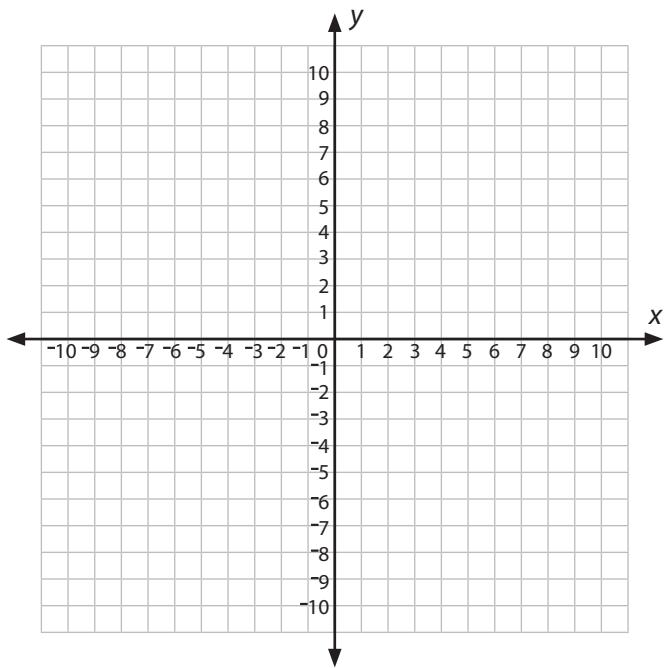
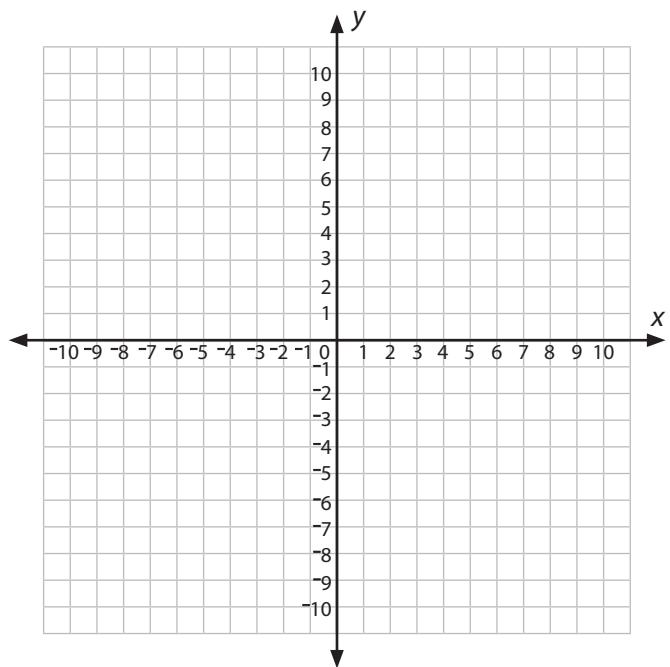
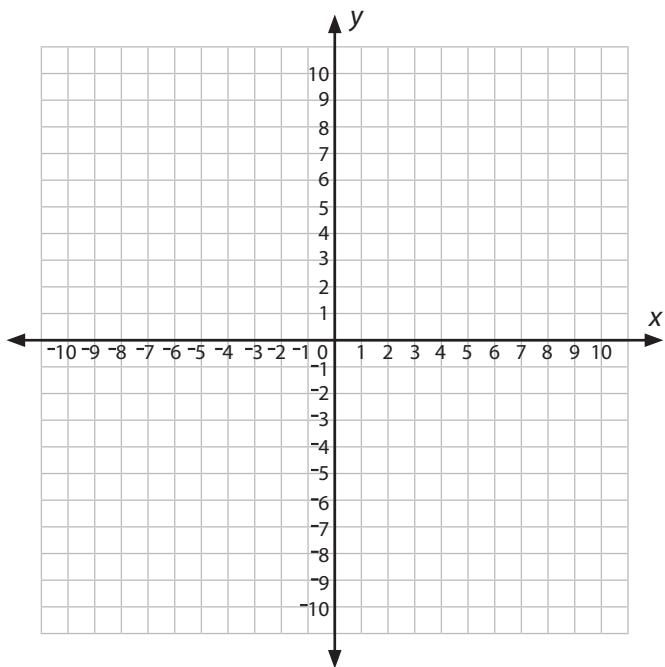
Guess & Check

1. During the summers, Nia volunteers at a nursing home and for a community cleanup crew. Last week she spent 32 hours doing volunteer work. She spent three times as many hours working with the community cleanup crew than at the nursing home. How many hours did she work for each volunteer activity?
 2. The upper elementary students recycled cans for a school fundraiser. They recycled a total of 275 pounds of aluminum cans. The fifth graders recycled 50 pounds more than the fourth graders. The sixth graders recycled 25 pounds more than the fifth graders. How many pounds of aluminum cans did each grade recycle?

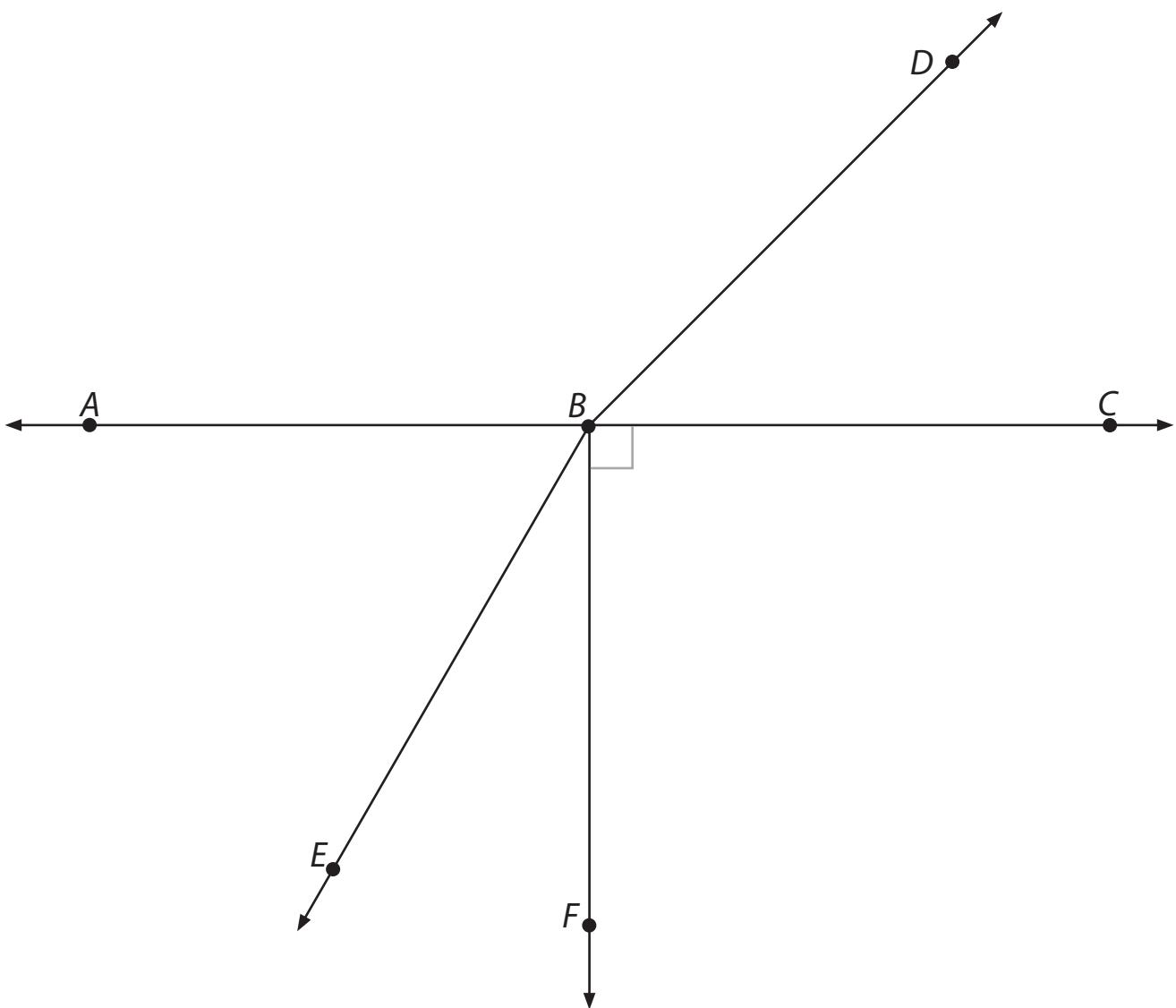
Coordinate Plane



Coordinate Planes



Angles



$$m\angle ABC = \underline{\hspace{2cm}}$$

$$m\angle FBC = \underline{\hspace{2cm}}$$

$$m\angle DBC = \underline{\hspace{2cm}}$$

$$m\angle EBF = \underline{\hspace{2cm}}$$

$$m\angle ABD = \underline{\hspace{2cm}}$$

$$m\angle CBE = \underline{\hspace{2cm}}$$

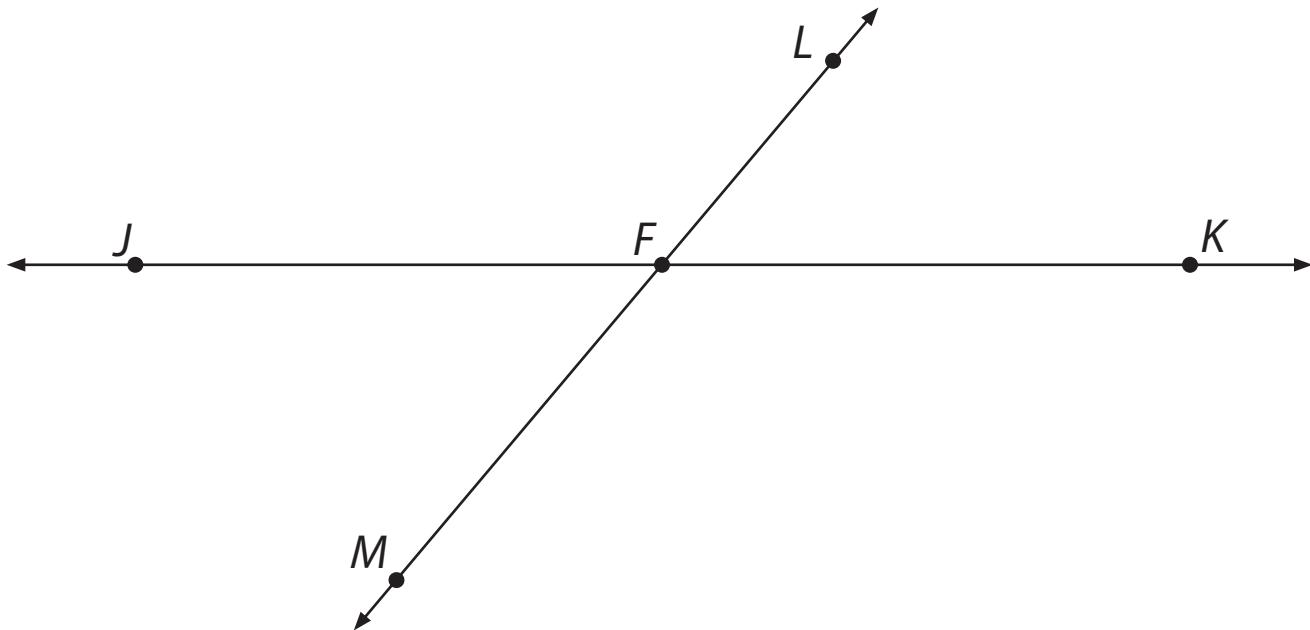
$$m\angle ABF = \underline{\hspace{2cm}}$$

$$m\angle EBD = \underline{\hspace{2cm}}$$

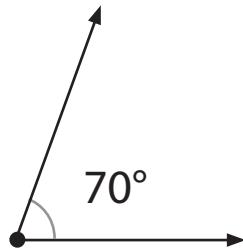
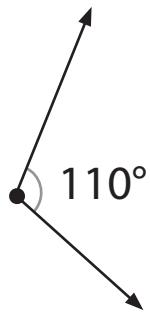
$$m\angle ABE = \underline{\hspace{2cm}}$$

Supplementary Angles

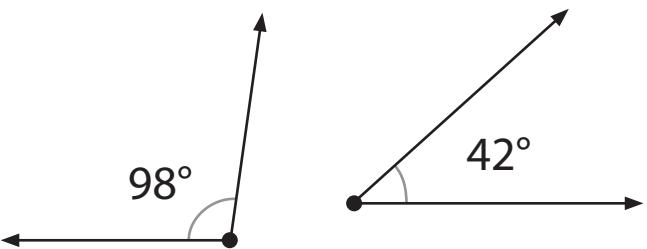
The measures of supplementary angles have a sum of 180° .



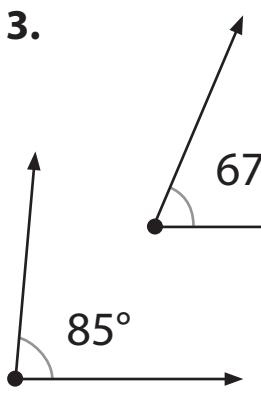
1.



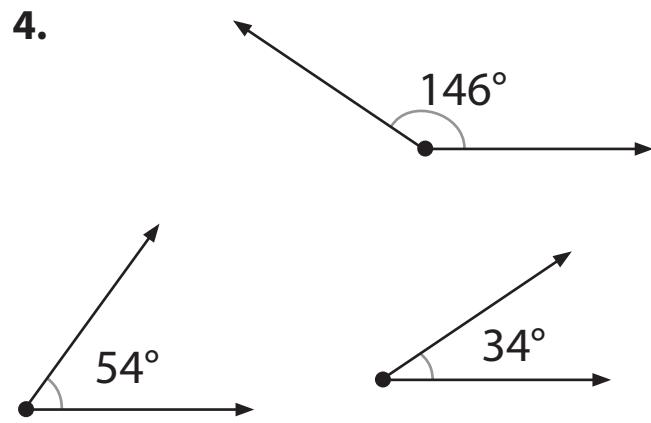
2.



3.

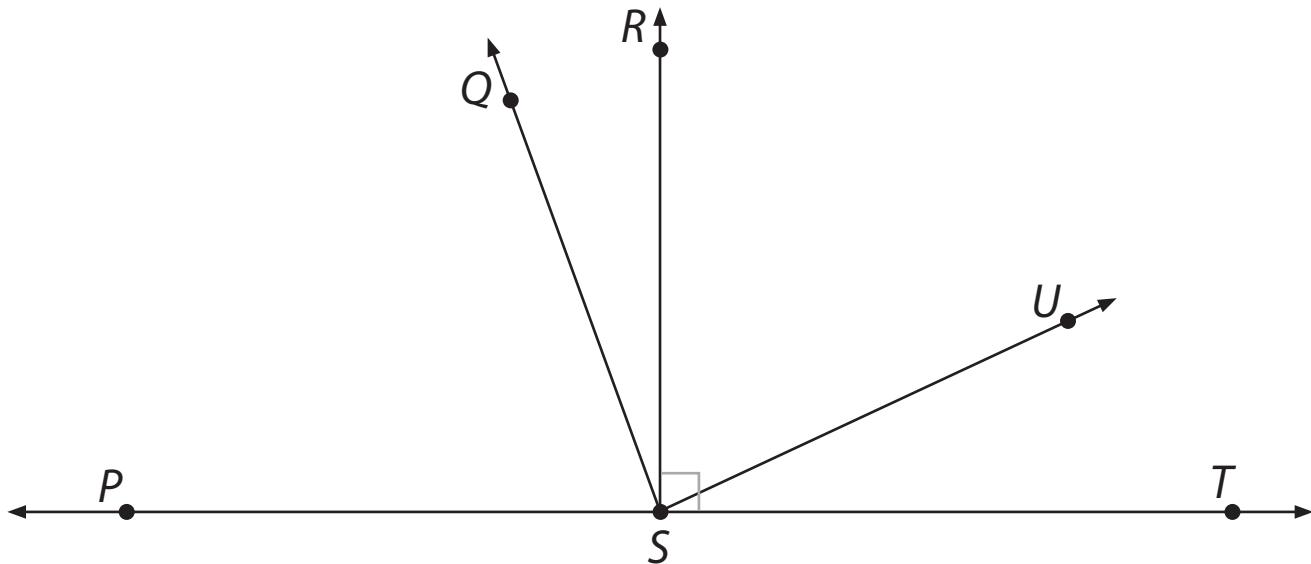


4.

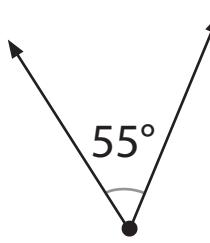


Complementary Angles

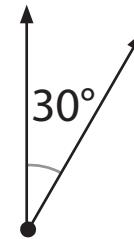
The measures of complementary angles have a sum of 90° .



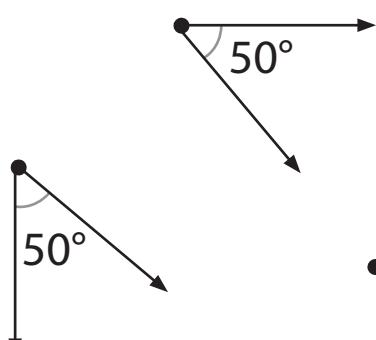
1.



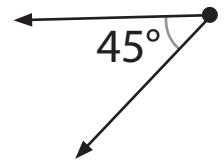
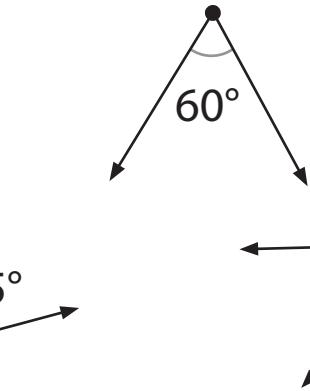
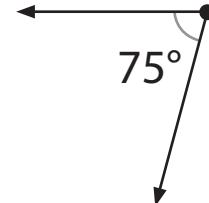
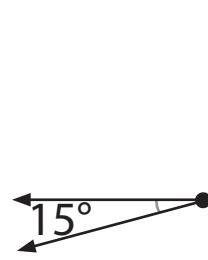
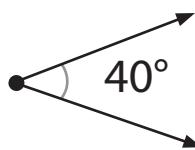
2.



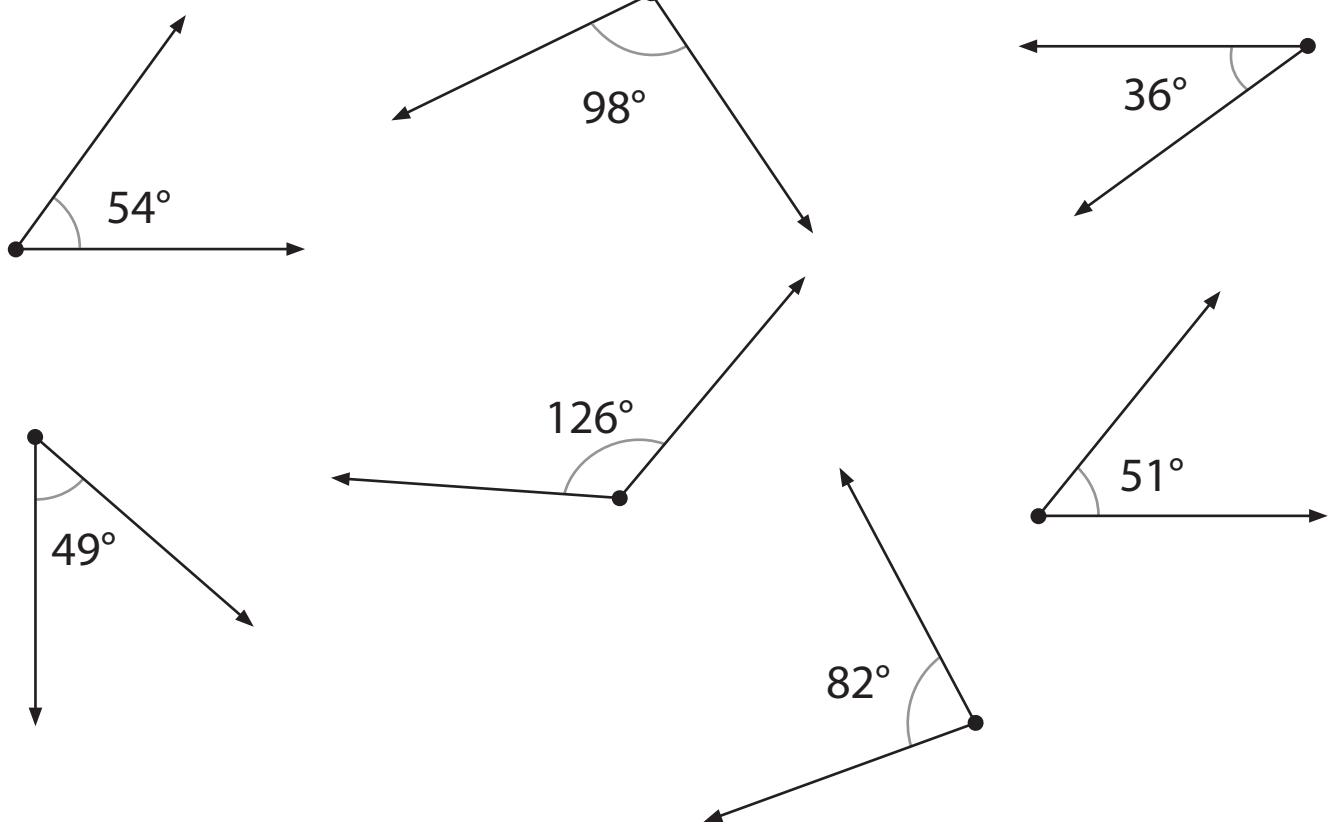
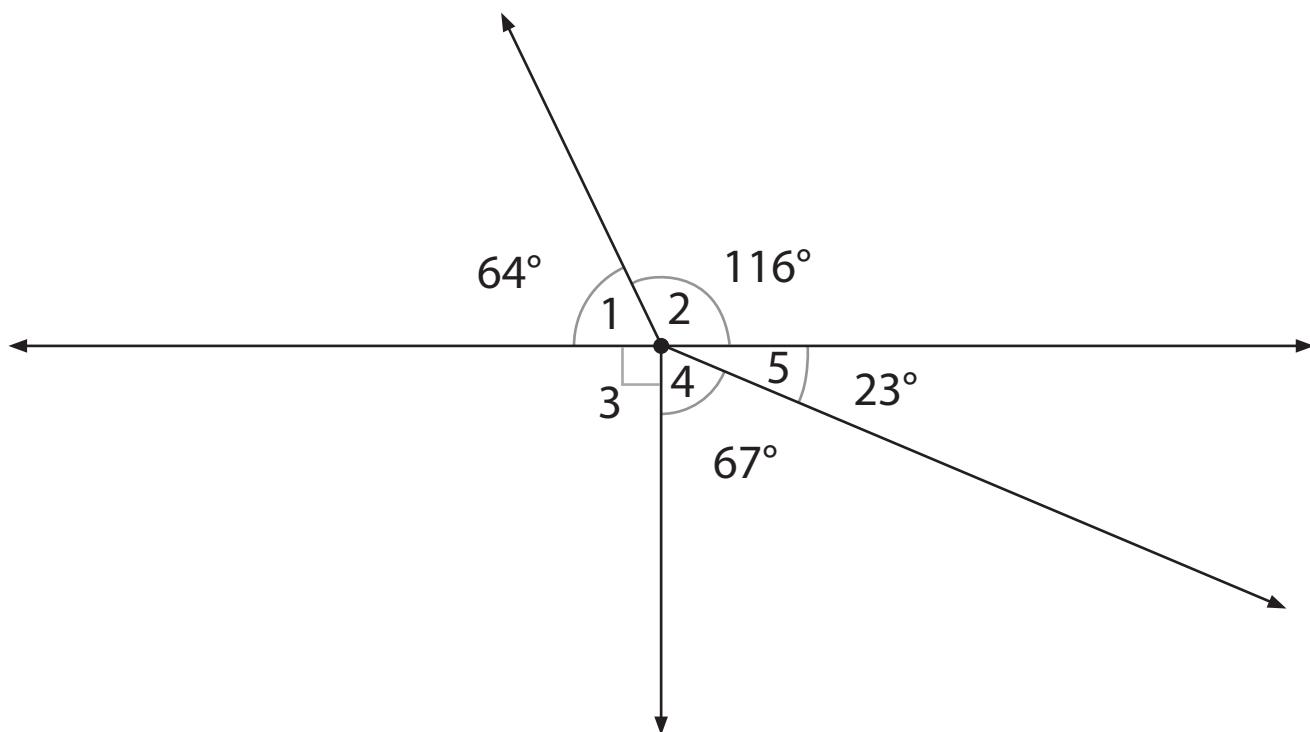
3.



4.



Complementary & Supplementary Angles



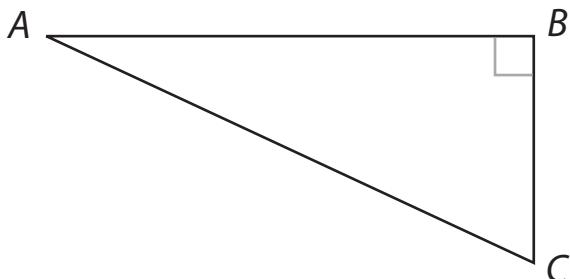
Triangles

$$\angle A = \underline{\hspace{2cm}}^\circ$$

$$\angle B = \underline{\hspace{2cm}}^\circ$$

$$\angle C = \underline{\hspace{2cm}}^\circ$$

$\triangle ABC$ _____



$$\overline{AB} = \underline{\hspace{2cm}}$$

$$\overline{BC} = \underline{\hspace{2cm}}$$

$$\overline{AC} = \underline{\hspace{2cm}}$$

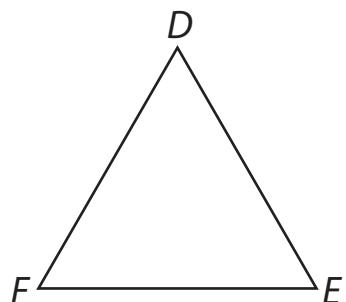
$\triangle ABC$ _____

$$\angle D = \underline{\hspace{2cm}}^\circ$$

$$\angle E = \underline{\hspace{2cm}}^\circ$$

$$\angle F = \underline{\hspace{2cm}}^\circ$$

$\triangle DEF$ _____



$$\overline{DF} = \underline{\hspace{2cm}}$$

$$\overline{DE} = \underline{\hspace{2cm}}$$

$$\overline{FE} = \underline{\hspace{2cm}}$$

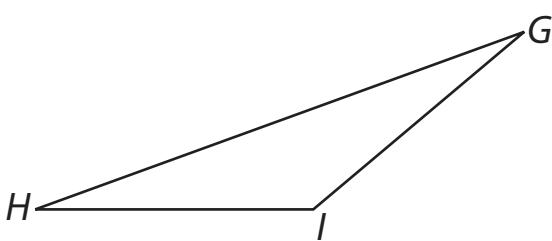
$\triangle DEF$ _____

$$\angle G = \underline{\hspace{2cm}}^\circ$$

$$\angle H = \underline{\hspace{2cm}}^\circ$$

$$\angle I = \underline{\hspace{2cm}}^\circ$$

$\triangle GHI$ _____

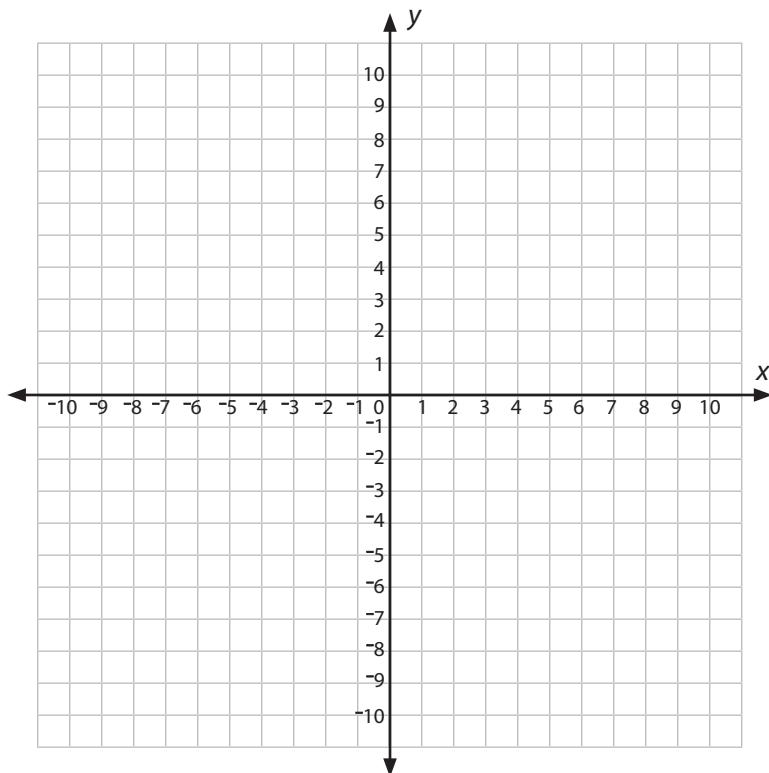


$$\overline{GH} = \underline{\hspace{2cm}}$$

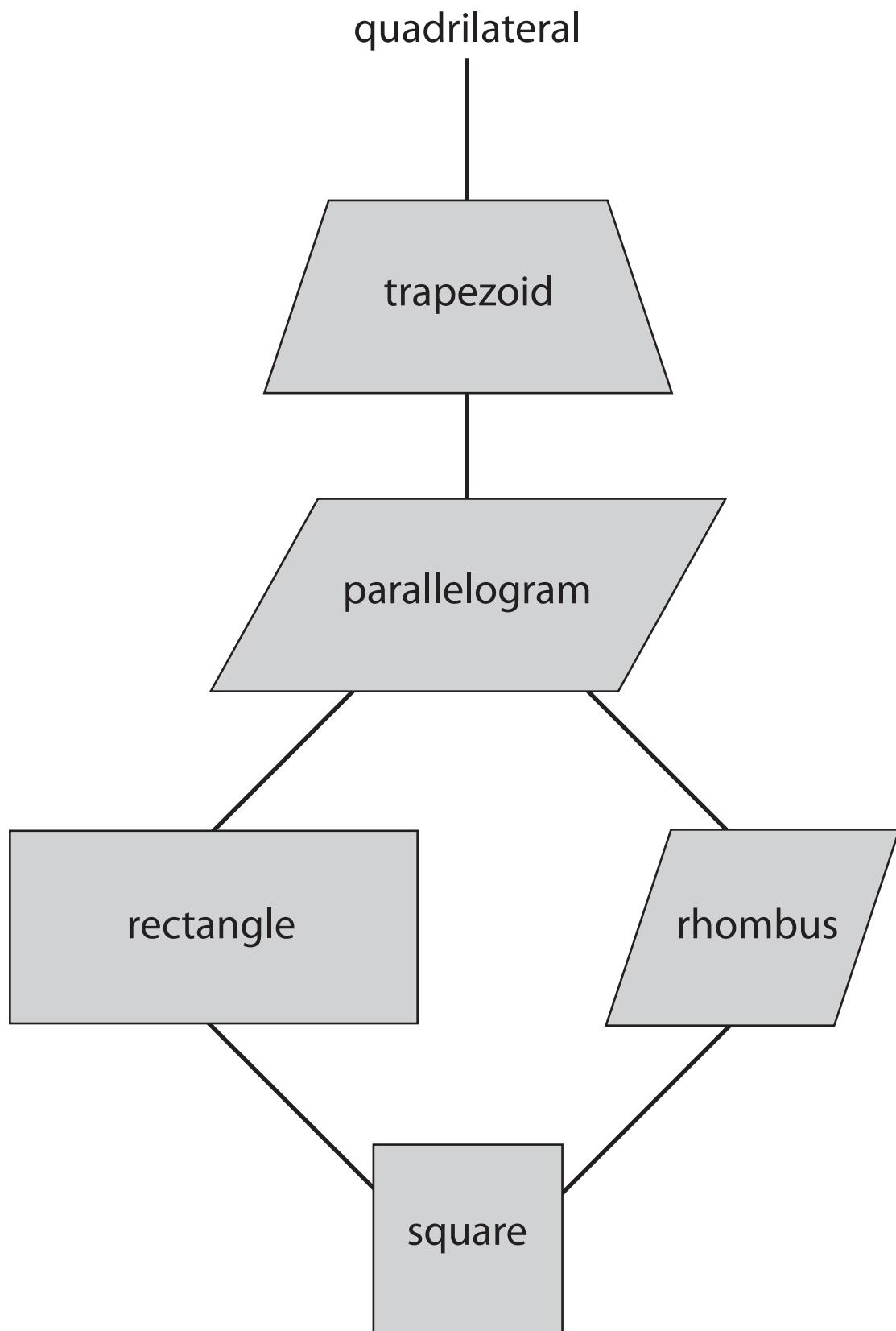
$$\overline{GI} = \underline{\hspace{2cm}}$$

$$\overline{HI} = \underline{\hspace{2cm}}$$

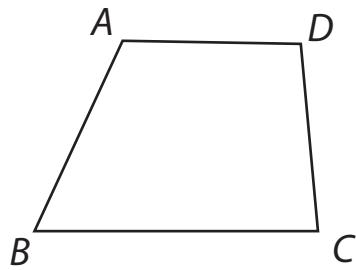
$\triangle GHI$ _____



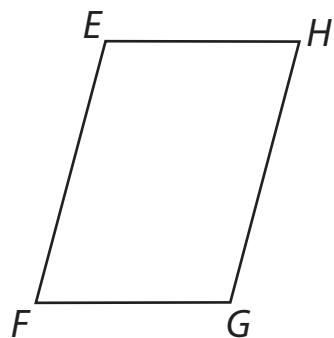
Hierarchy of Quadrilaterals



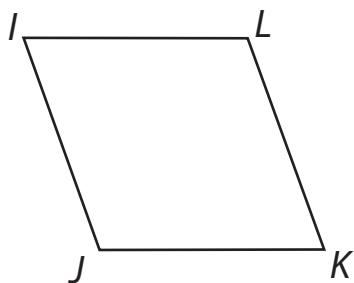
Quadrilaterals



$$\begin{array}{ll} \angle A = \underline{115}^\circ & \overline{AB} = \underline{\hspace{1cm}} \\ \angle B = \underline{65}^\circ & \overline{BC} = \underline{\hspace{1cm}} \\ \angle C = \underline{85}^\circ & \overline{CD} = \underline{\hspace{1cm}} \\ \angle D = \underline{\hspace{1cm}}^\circ & \overline{AD} = \underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} \parallel \underline{\hspace{1cm}} \end{array}$$



$$\begin{array}{ll} \angle E = \underline{\hspace{1cm}}^\circ & \overline{EF} = \underline{\hspace{1cm}} \\ \angle F = \underline{\hspace{1cm}}^\circ & \overline{FG} = \underline{\hspace{1cm}} \\ \angle G = \underline{\hspace{1cm}}^\circ & \overline{GH} = \underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} \parallel \underline{\hspace{1cm}} \\ \angle H = \underline{\hspace{1cm}}^\circ & \overline{EH} = \underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} \parallel \underline{\hspace{1cm}} \end{array}$$



$$\begin{array}{ll} \angle I = \underline{\hspace{1cm}}^\circ & \overline{IJ} = \underline{\hspace{1cm}} \\ \angle J = \underline{\hspace{1cm}}^\circ & \overline{JK} = \underline{\hspace{1cm}} \\ \angle K = \underline{\hspace{1cm}}^\circ & \overline{KL} = \underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} \parallel \underline{\hspace{1cm}} \\ \angle L = \underline{\hspace{1cm}}^\circ & \overline{IL} = \underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} \parallel \underline{\hspace{1cm}} \end{array}$$

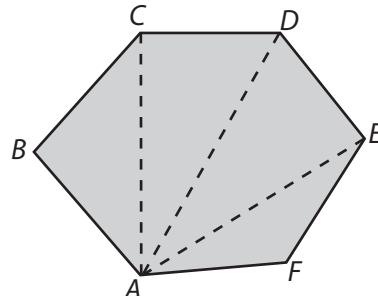
Polygon Angle Measure

Since you know that the sum of the measurements of the angles of a triangle is 180° , you can determine the sum of the measurements of the angles of other polygons.

Finding the Sum of the Measures of the Angles of a Polygon

- Draw line segments from point A to every other vertex in the polygon.
- Count the number of triangles.
- Multiply the number of triangles times 180° .

$$4 \times 180^\circ = 720^\circ$$



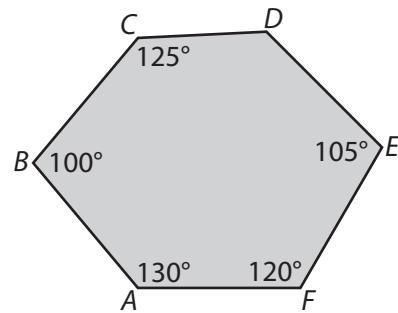
Finding the Measurement of the Unknown Angle in a Polygon

- Add the measurements of the known angles.
- Subtract the sum from the total number of degrees for that polygon.

$$105^\circ + 120^\circ + 130^\circ + 100^\circ + 125^\circ = 580^\circ$$

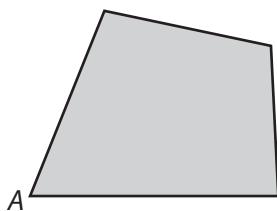
$$720^\circ - 580^\circ = 140^\circ$$

$$\angle D = 140^\circ$$

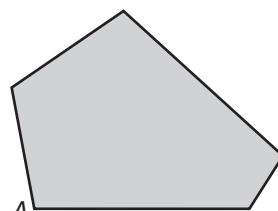


Trace the figure or draw a similar figure. Draw line segments to connect point A with every other vertex. Write an equation to find the sum of the measurements of the angles for each polygon. Solve.

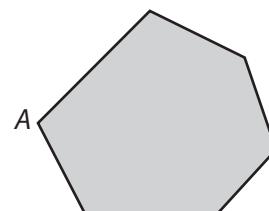
1.



2.

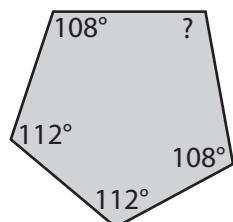


3.

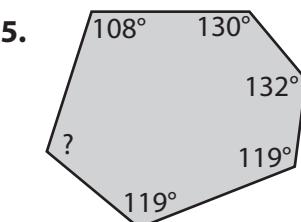


Find the measure of the unknown angle. Write the equations you use.

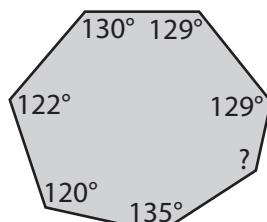
4.



5.



6.



Congruent & Similar Polygons

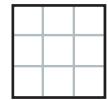
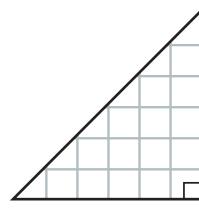
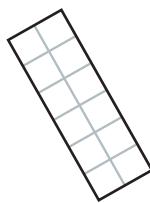
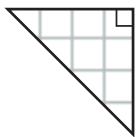
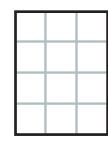
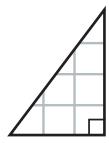
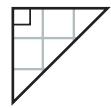
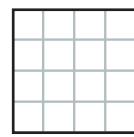
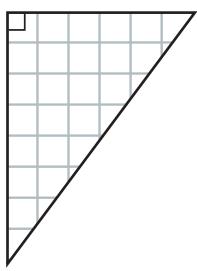
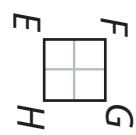
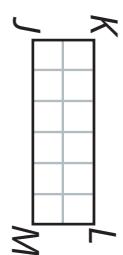
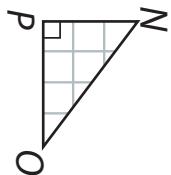
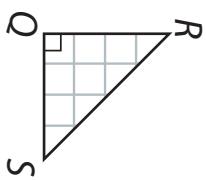
Original

1

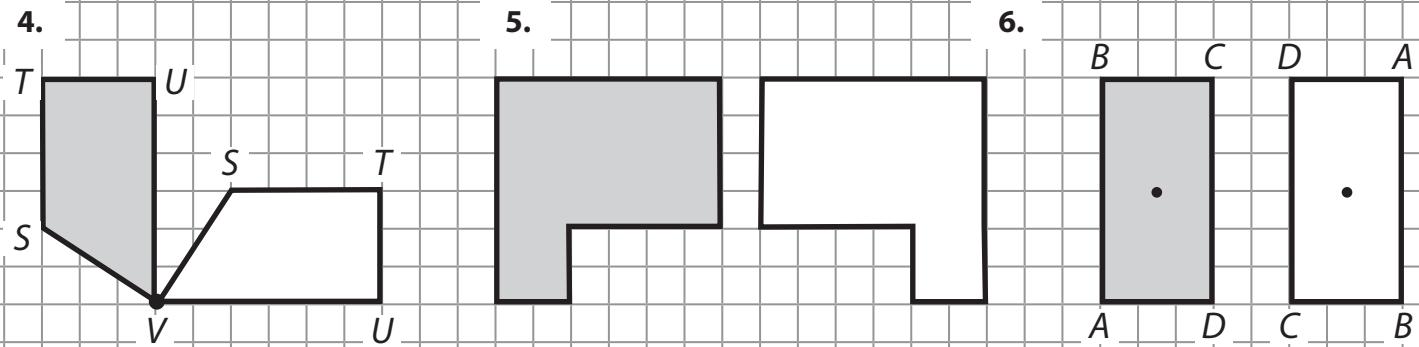
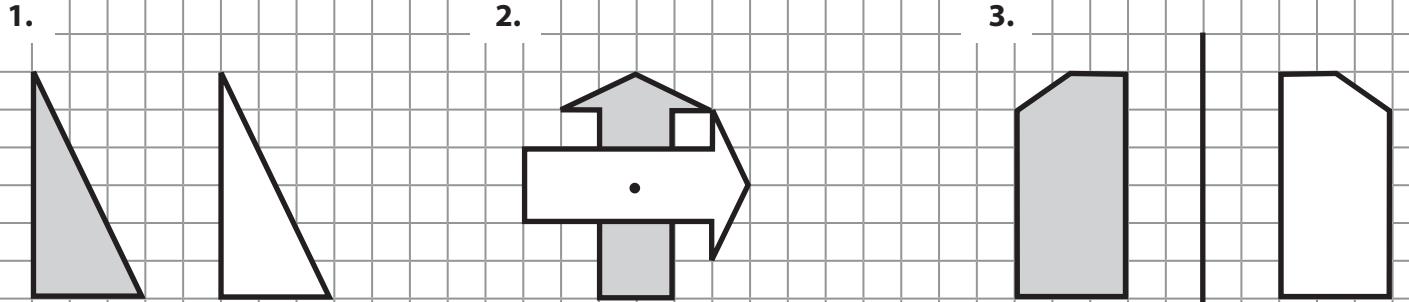
2

3

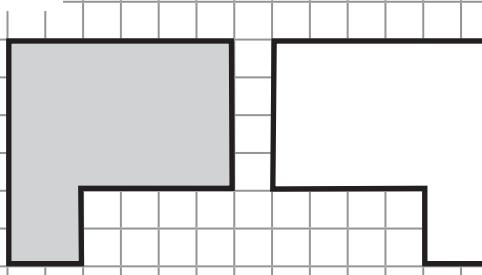
4



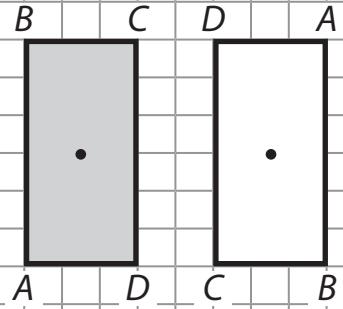
Transformations



5.



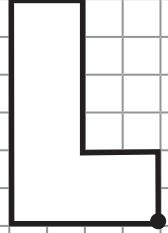
6.



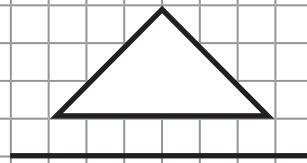
7. translate 4 units down



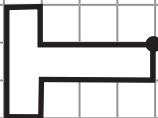
8. $\frac{1}{4}$ clockwise rotation



9. reflection



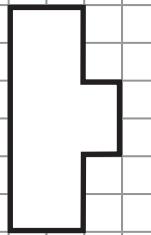
10. $\frac{1}{2}$ clockwise rotation



11. translate 4 units right



12. reflection

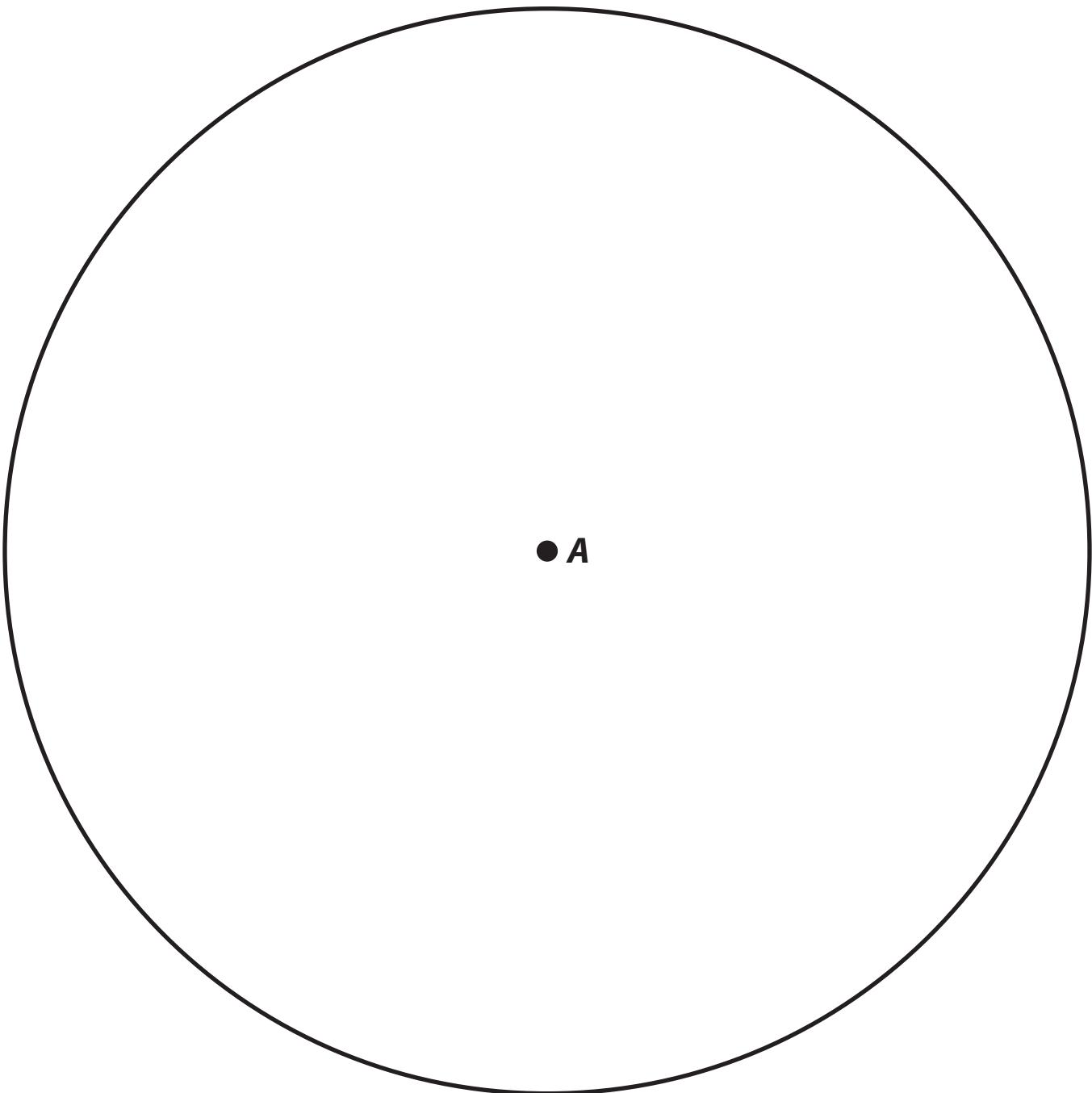


Block Letters

A B C D E F G H
I J K L M N O P
Q R S T U V W
X Y Z

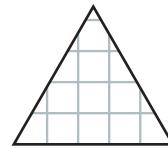
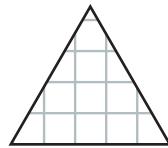
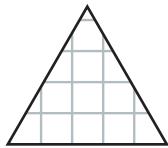
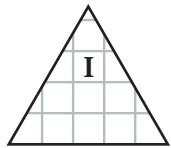
A B C D E F G H
I J K L M N O P
Q R S T U V W
X Y Z

Circle

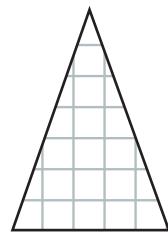
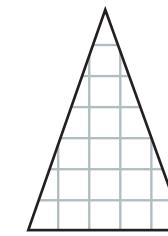
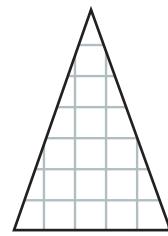
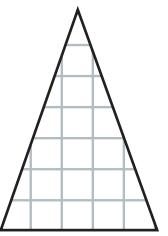
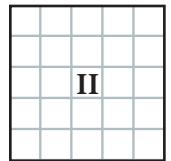


Polyhedrons

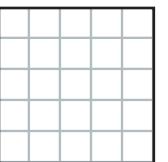
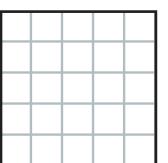
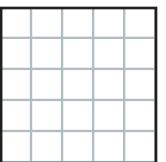
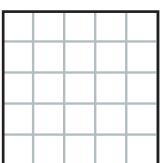
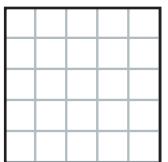
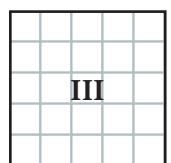
I.



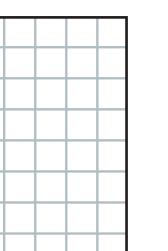
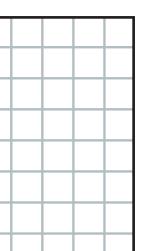
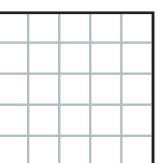
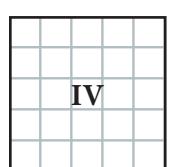
II.



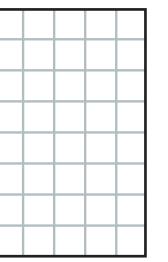
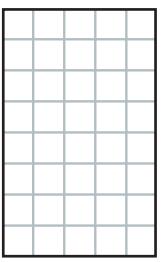
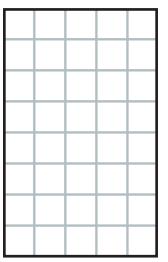
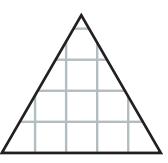
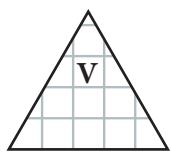
III.



IV.



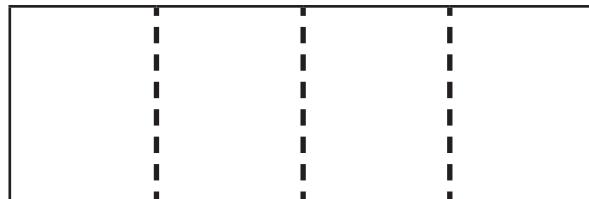
V.



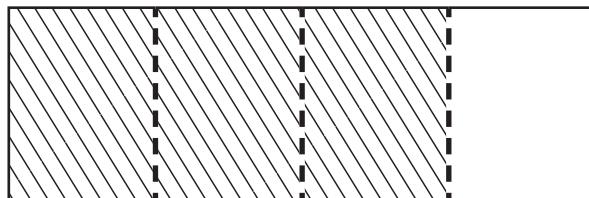
Fraction Paper Folding

To find $\frac{1}{3}$ of $\frac{3}{4}$, follow these steps:

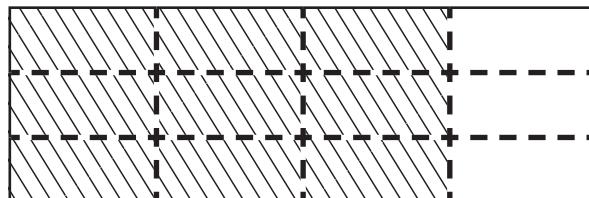
1. Begin with the second factor ($\frac{3}{4}$) and fold the paper in one direction to match the denominator (fourths).



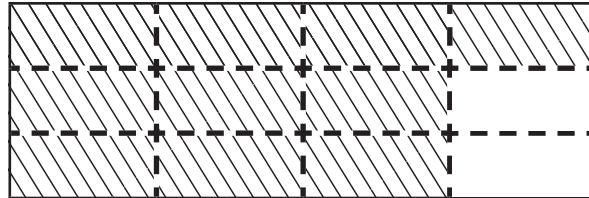
2. Unfold the paper and shade the part of the whole that is equivalent to the second factor ($\frac{3}{4}$).



3. Fold the paper in the other direction to match the denominator of the first factor (thirds).

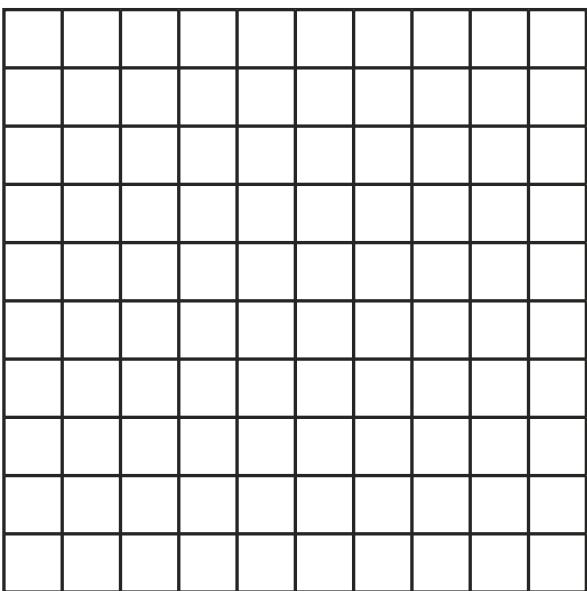
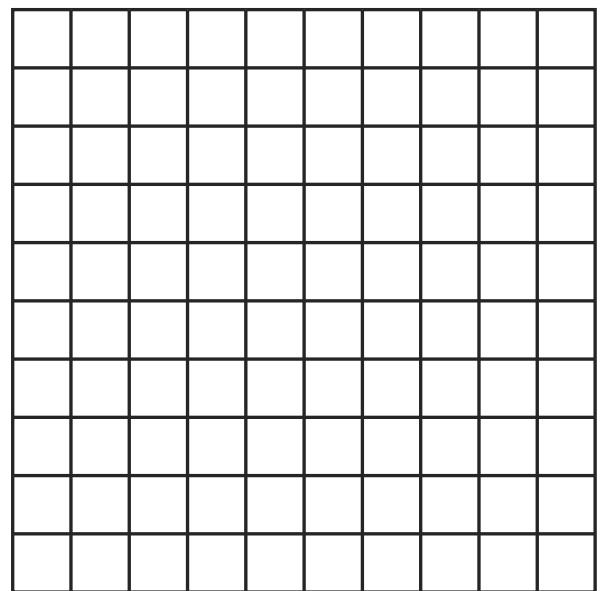
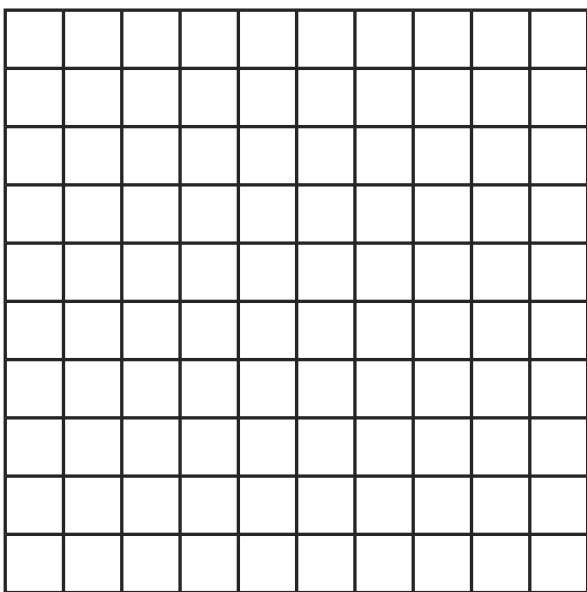
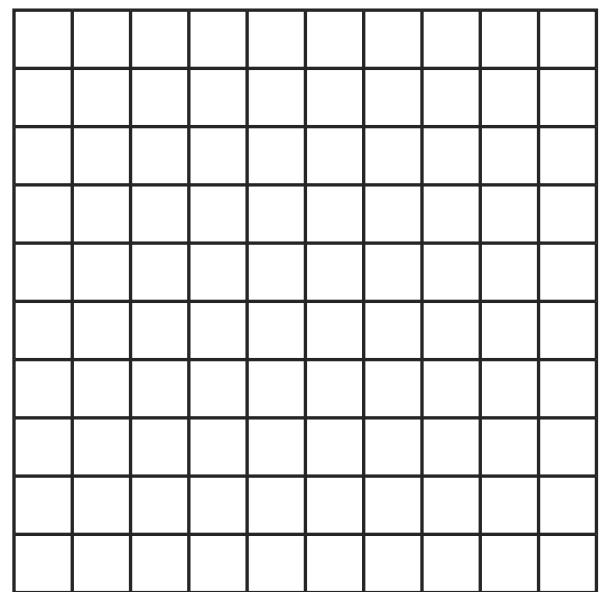
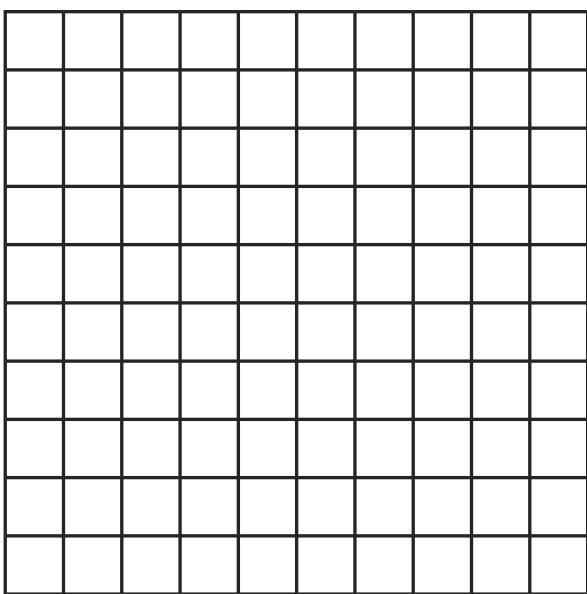
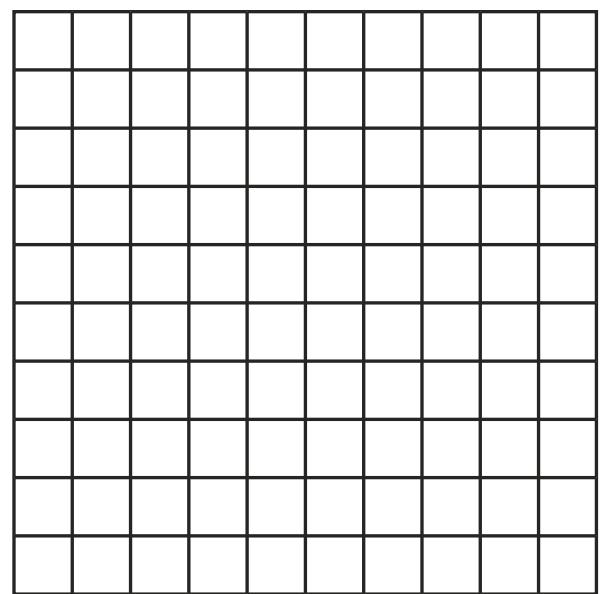


4. Unfold the paper and shade the part of the whole that is equivalent to the first factor ($\frac{1}{3}$).

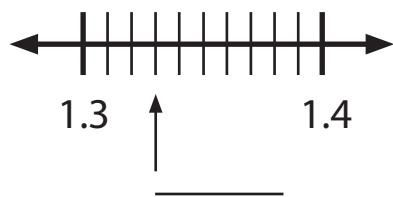
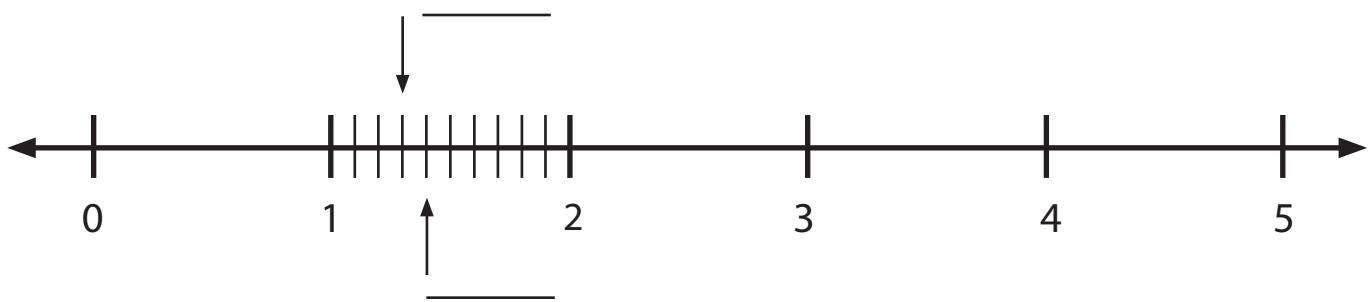


5. The double-shaded part is the answer ($\frac{3}{12}$ or $\frac{1}{4}$).

Decimal Grids



In-Between Numbers



1.3 _____ 1.33 _____ 1.37 _____ 1.4

1.33 _____

_____ 1.34

2.4 _____

2.5

0.53 _____

0.54

1.627 _____

1.628

Multi-Step Word Problems

- 1.** Jacob is buying shoes for Ryan and Ella, a missionary couple who are home on furlough. Ryan chose a pair of shoes that cost \$82.69. Ella selected a pair that cost \$46.98 and a matching purse priced at \$18.95. The store is having a sale. If a customer buys two pairs of shoes, the pair that costs less will be half price. How much will Jacob pay for both pairs of shoes?

- 2.** Madelyn volunteered to make 84 brownies and 6 dozen jumbo cookies for the Sunday school picnic. If an equal number of these desserts will be placed on serving trays, how many brownies and cookies will be on each tray?

- 3.** Mr. Cameron harvested $75\frac{3}{4}$ pounds of walnuts from his trees. He sold $\frac{2}{3}$ of the walnuts at a local farmers' market and gave an equal amount of the remaining walnuts to 5 of his neighbors. To the nearest pound, how many pounds of walnuts did each neighbor receive?

Input/Output Tables

1.	Input	Output

2.	Input	Output

3.	Input	Output

4.	Input	Output

Dividing Decimals

$$\mathbf{1.} \ 4) \overline{283.64}$$

$$\mathbf{2.} \ 7) \overline{87.38}$$

$$\mathbf{3.} \ 18) \overline{4.6}$$

$$\mathbf{4.} \ 3) \overline{52}$$

$$\mathbf{5.} \ 26) \overline{398.18}$$

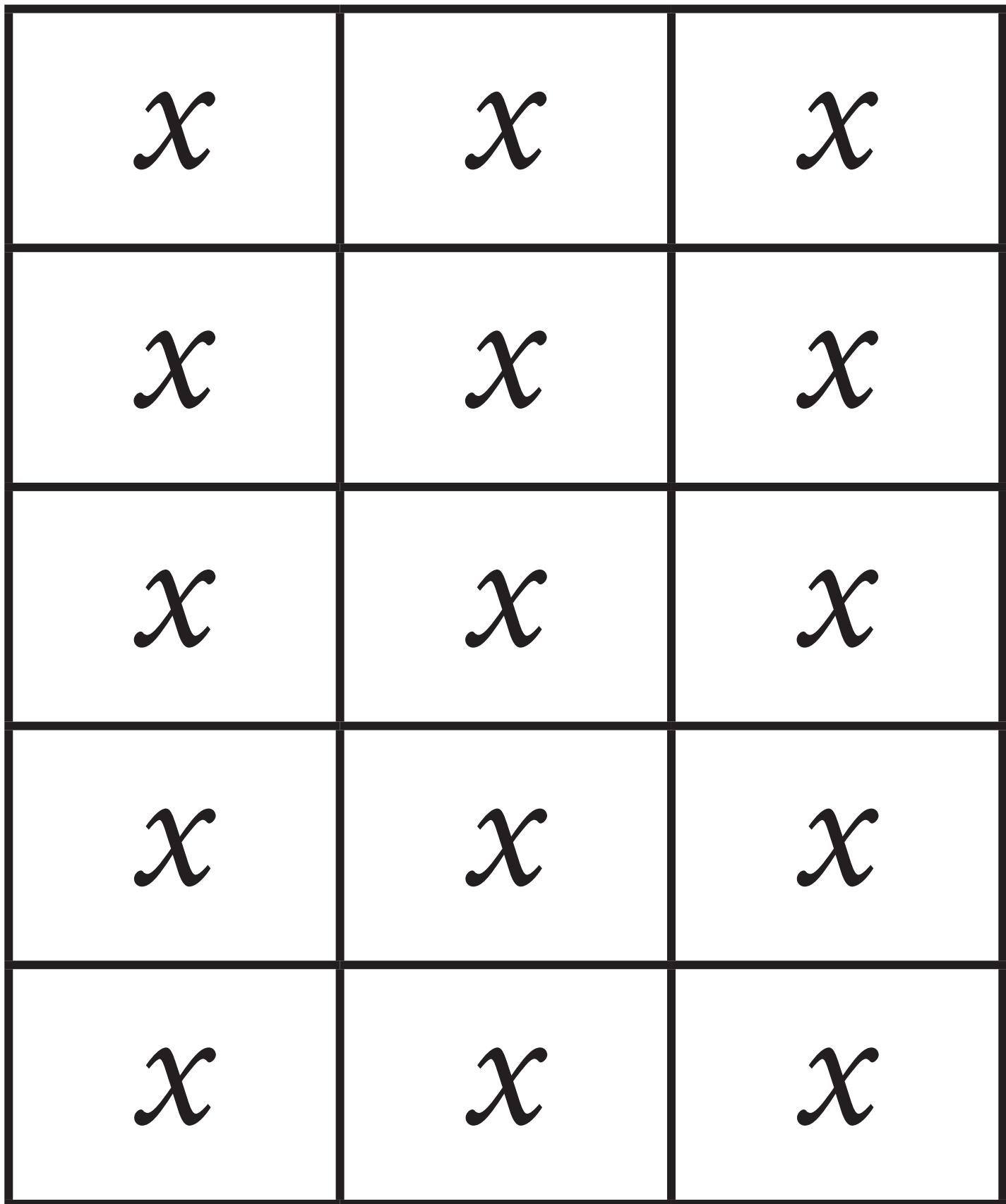
$$\mathbf{6.} \ 42) \overline{38}$$

$$\mathbf{7.} \ 0.8) \overline{45}$$

$$\mathbf{8.} \ 3.6) \overline{3.68}$$

$$\mathbf{9.} \ 0.21) \overline{7.13}$$

Variable Cards





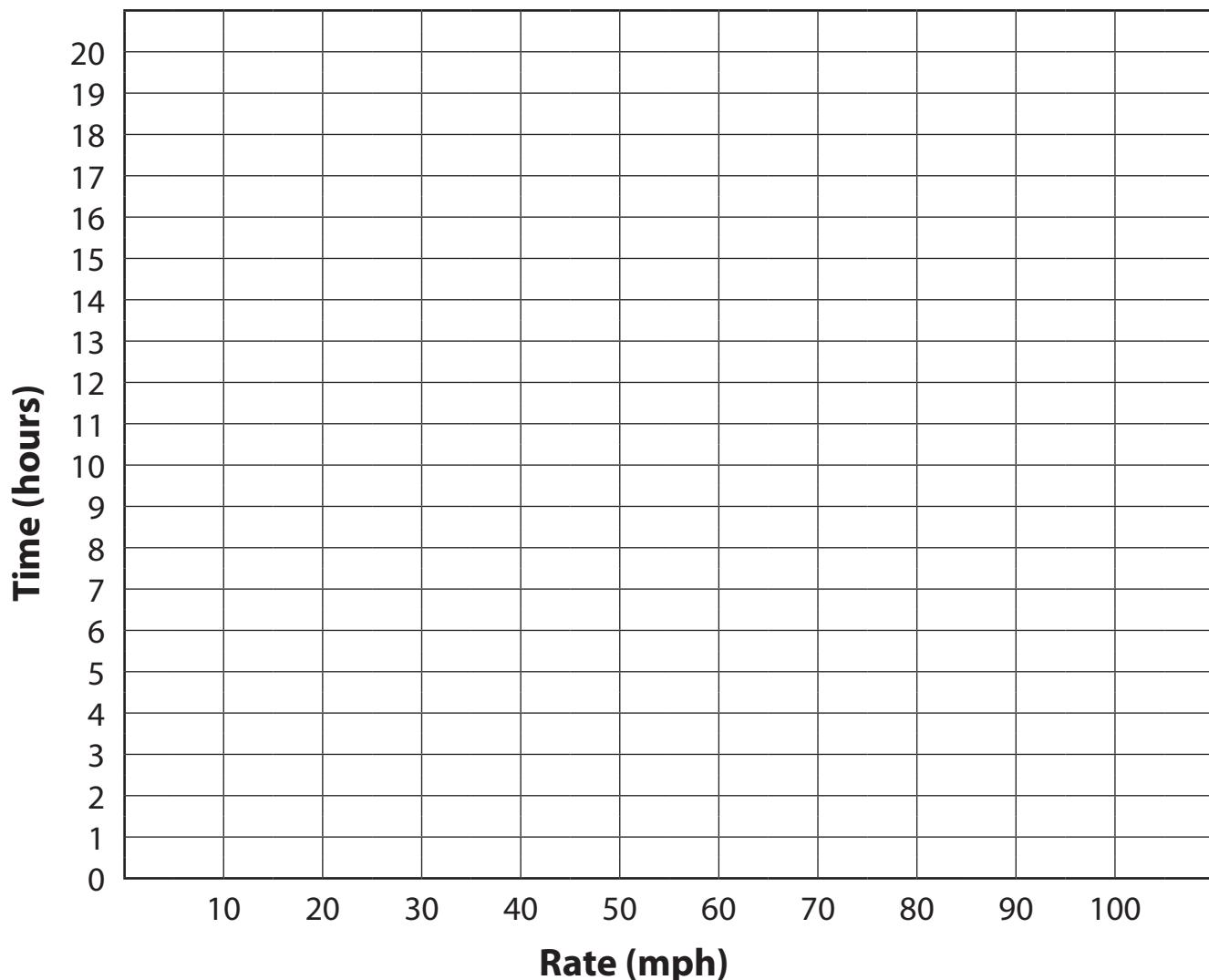
Graph an Equation

$$\text{distance} = \text{rate} \times \text{time}$$

$$d = r \times t$$

Rate (mph)	10	20	30	40	50	60	70	80	90	100
Time (hours)										

Traveling 200 Miles

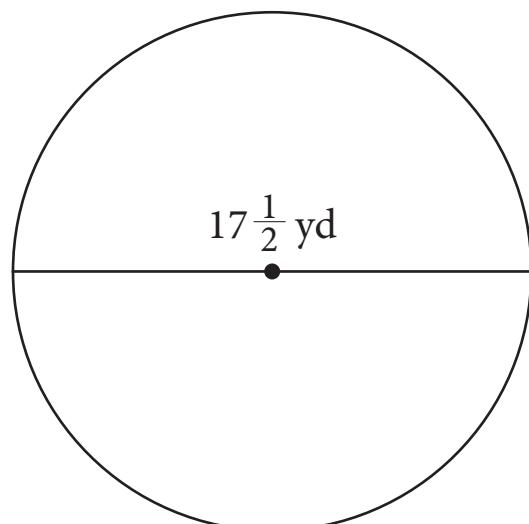
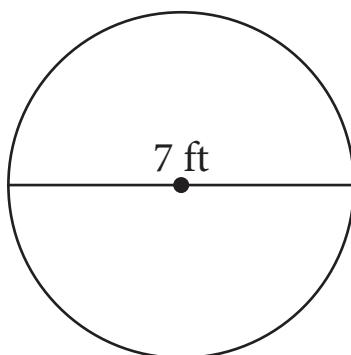
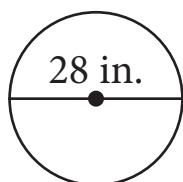


Find the Circumference

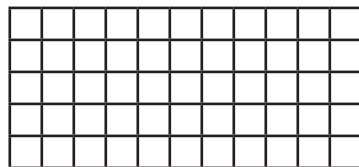
1. Write the number of the object in the first column.
2. Place a string around the object to find the circumference. Measure the string to the nearest millimeter. Record the circumference in the second column.
3. Use the ruler to measure the diameter of the object to the nearest millimeter. Write the diameter in the third column.
4. Divide the circumference by the diameter. Round your answer to the nearest hundredth and write it in the fourth column.
5. Multiply the diameter of the object by π (3.14) to find the circumference. Write the circumference in the last column.

Object	Measured Circumference	Measured Diameter	Circumference/diameter relationship $\frac{C}{d} = \pi$	Circumference formula $C = \pi d$

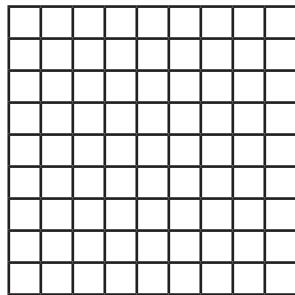
Multiply the diameter of each circle by π ($\frac{22}{7}$) to find the circumference.



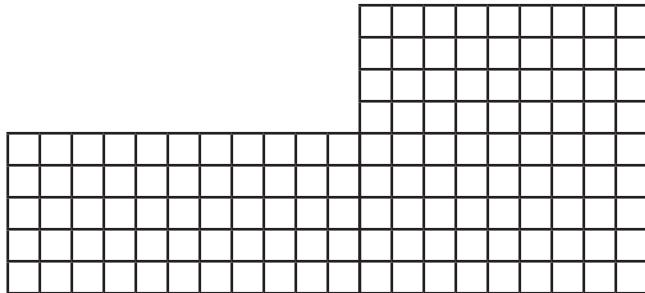
Area: Squares, Rectangles & Parallelograms



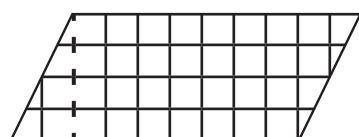
rectangle



square

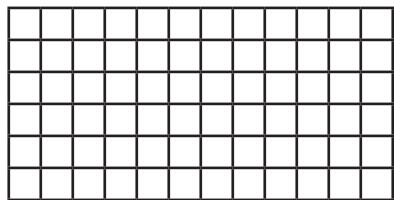


complex figure



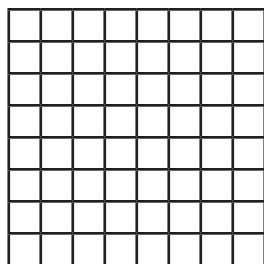
parallelogram

Area: Triangles



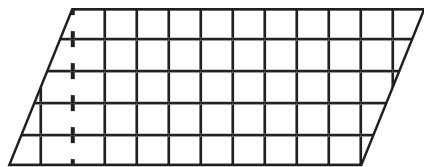
rectangle

triangle



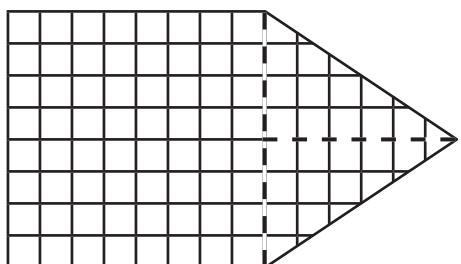
square

triangle



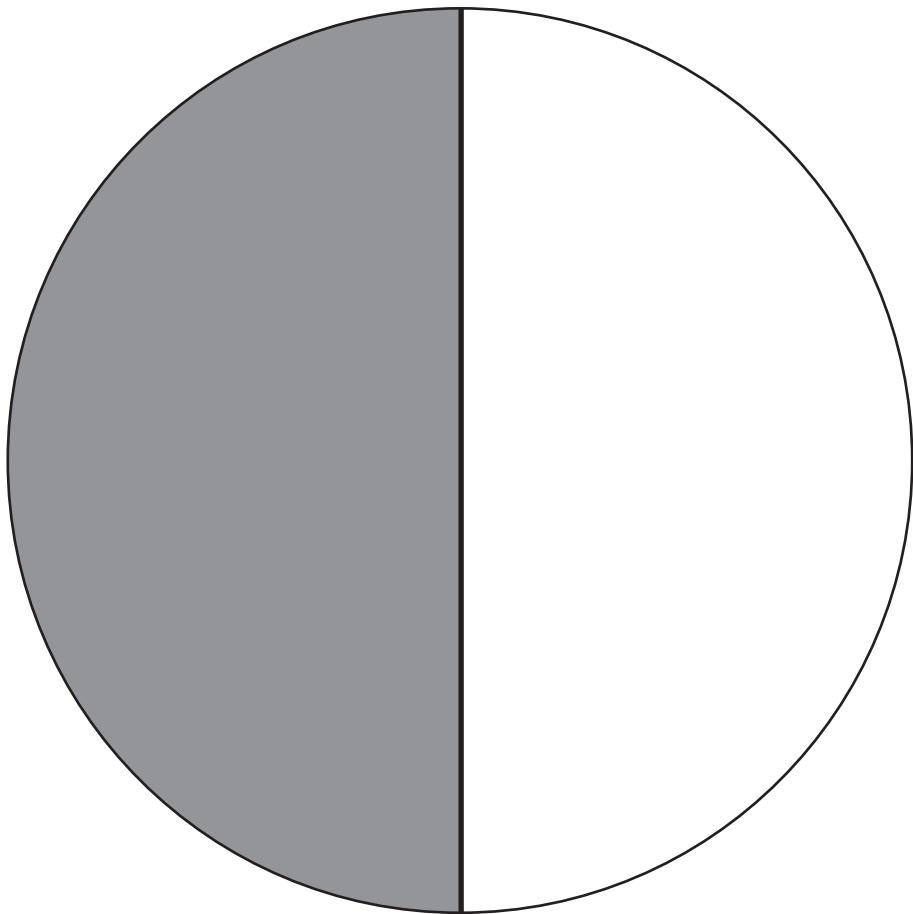
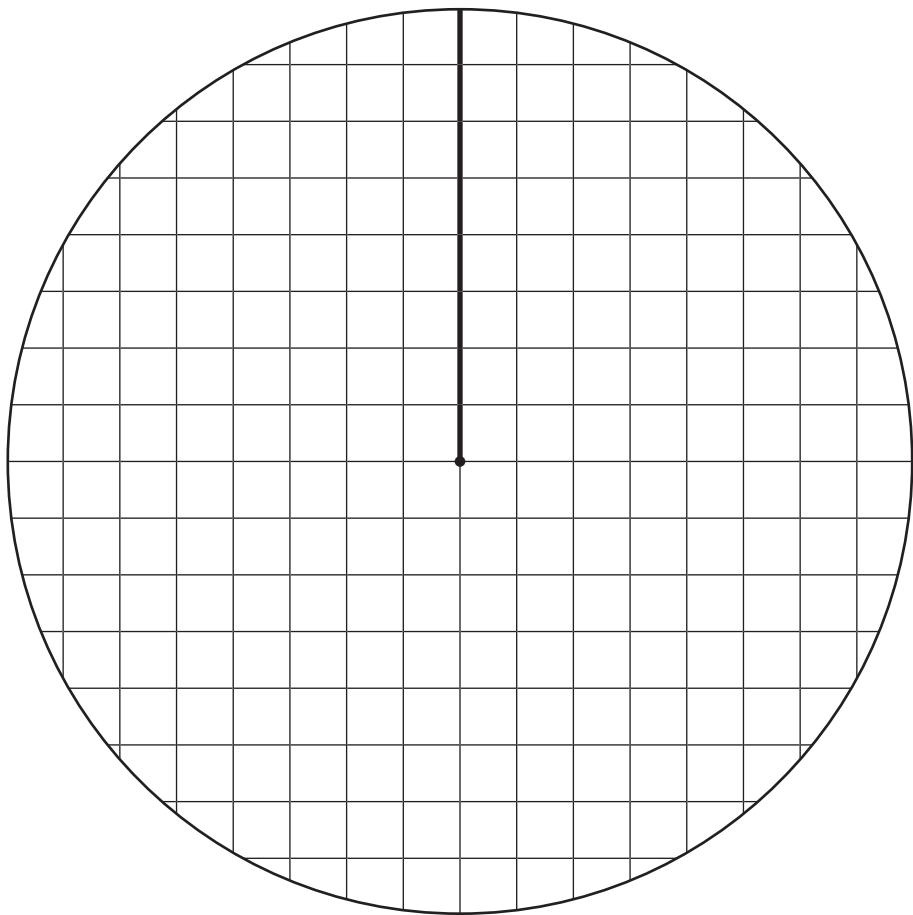
parallelogram

triangle

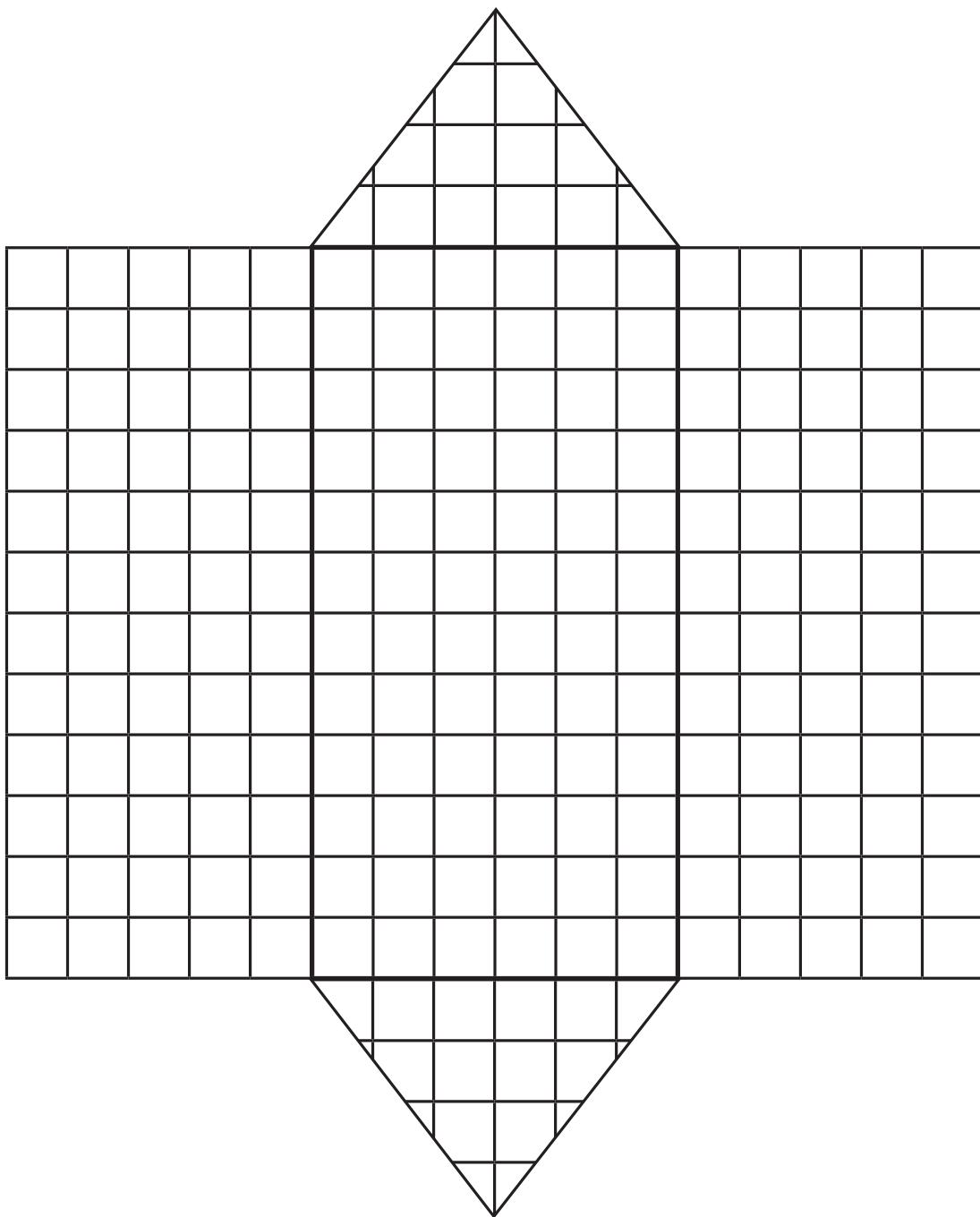


complex figure

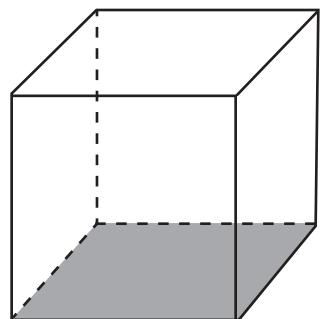
Area: Circles



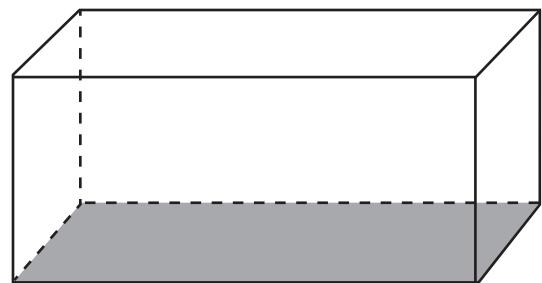
Surface Area: Triangular Prism



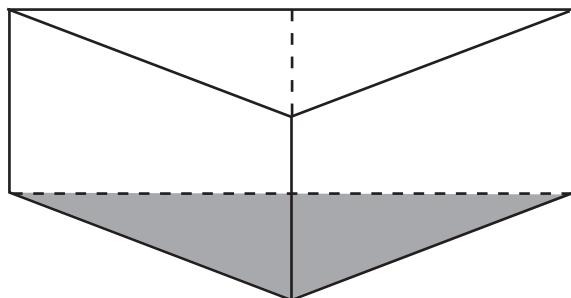
Surface Area



cube



rectangular prism



triangular prism



cylinder

Floor Plan Activity

Assignment:

Create a floor plan for a house with an area of 1500 square feet.

Materials:

- Floor Plan Grid (or graph paper, 30 squares \times 50 squares)
- 9" \times 12" sheet of construction paper
- scissors
- glue stick

Requirements:

1. Use all 1500 squares in your floor plan. The fixed area of the house is 1500 ft².
The area of a house includes only the heated living areas. Your floor plan does not include a carport, a garage, or additional outside buildings.
2. Include a minimum of 6 rooms: 3 bedrooms, 1 bathroom, a kitchen, and a living room.
3. Include hallways where needed.
4. Use only full squares in your floor plan.

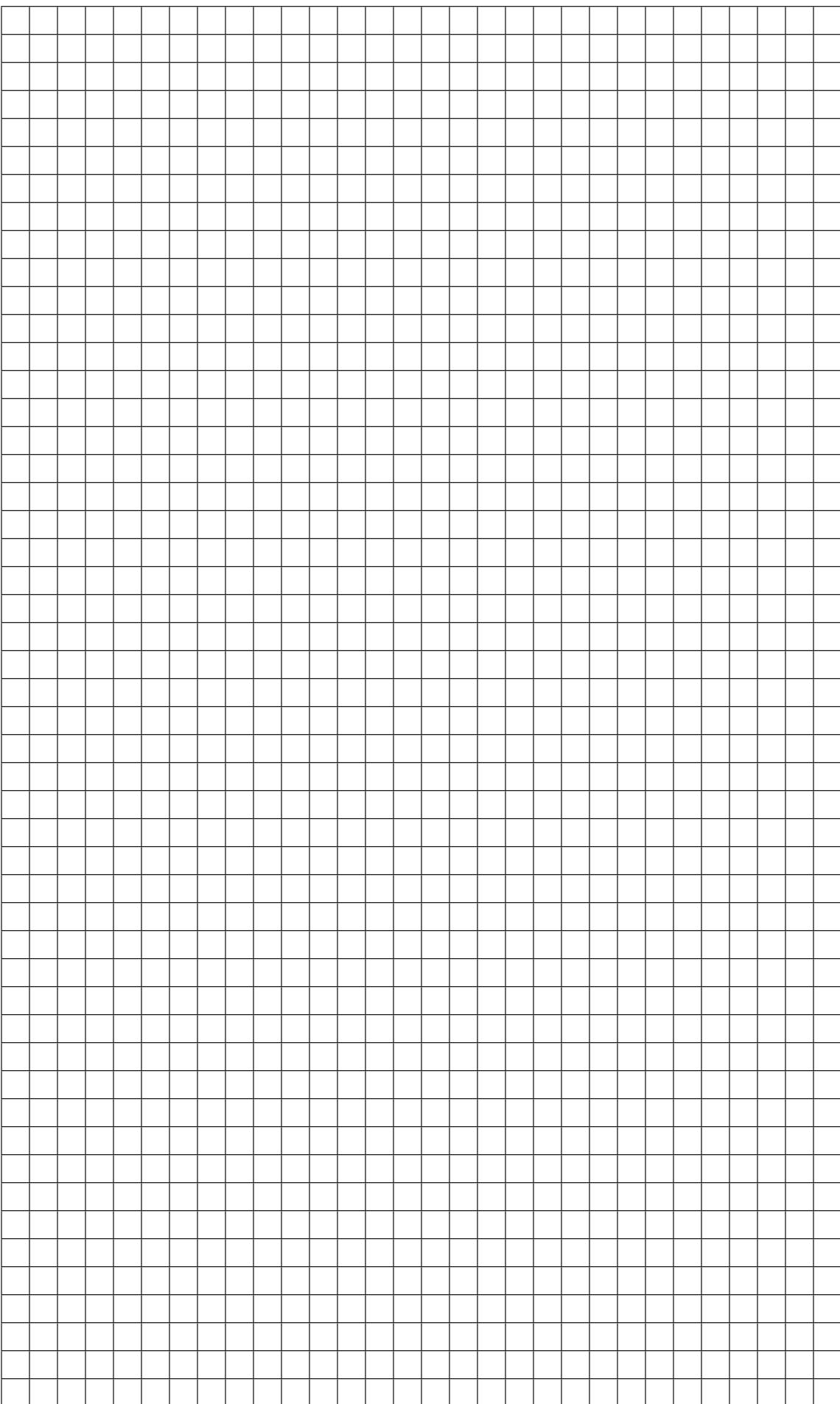
Procedures:

1. Sketch the general layout of the house.
2. Consider the area you want in a room. Draw an outline of the room on the Floor Plan Grid and then cut out the area.
3. Place all the rooms on the construction paper.
4. Analyze the layout. Do you need to add a hallway? Do you want to make a room larger or smaller? If you have leftover squares, what extra room will you add to the house, or will you enlarge some rooms?
5. After you have used all your squares and have checked the layout of the rooms, glue the rooms to the construction paper.

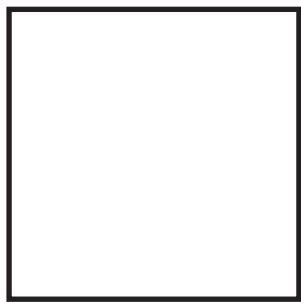
Extra Details:

You may choose to draw the doorways leading into rooms. (A doorway should be at least 3 ft wide.) You may choose to draw closets in the bedrooms. (A closet can be any size.) You may choose to draw the cabinets in the kitchen and bathroom. (Because you are working only with full squares, cabinets should be 2 ft deep.)

Floor Plan Grid

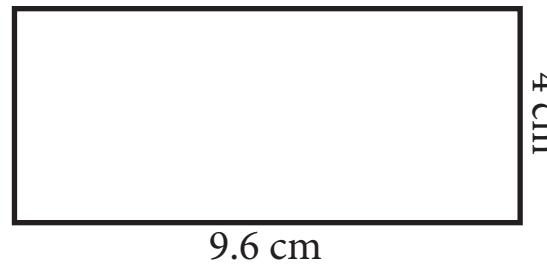


Geometry Review I



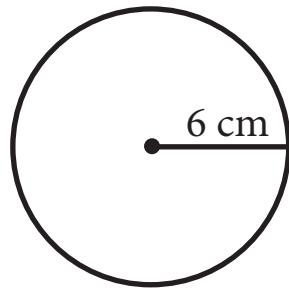
perimeter

area



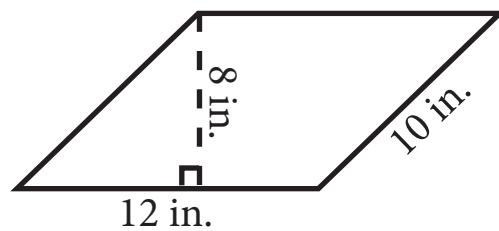
perimeter

area



circumference

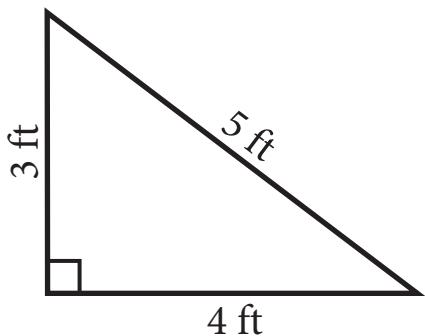
area



perimeter

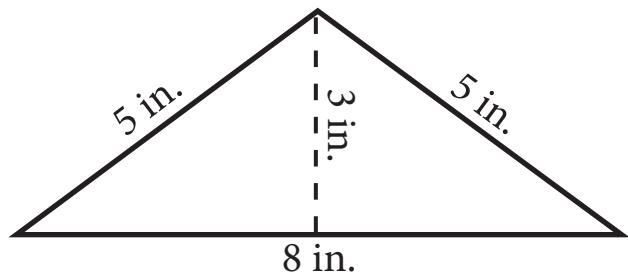
area

Geometry Review II



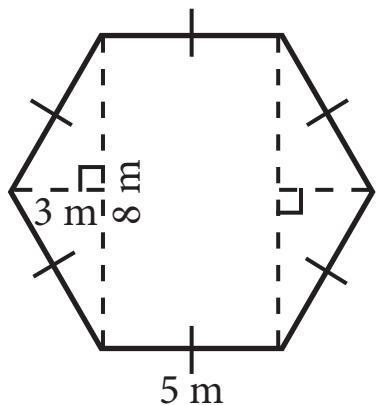
perimeter

area



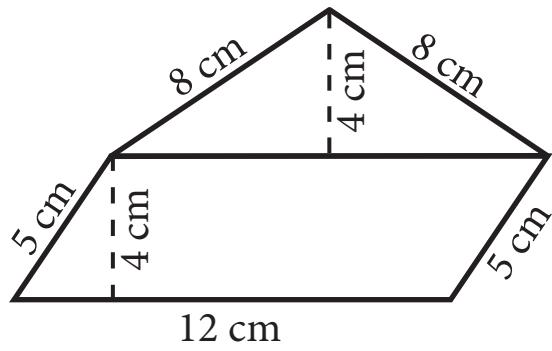
perimeter

area



perimeter

area

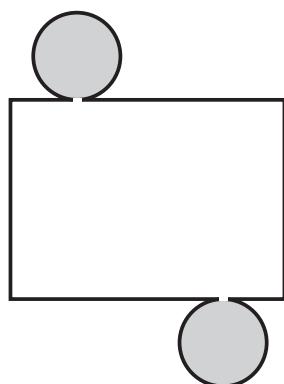


perimeter

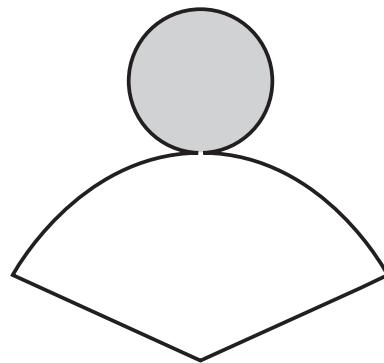
area

Nets

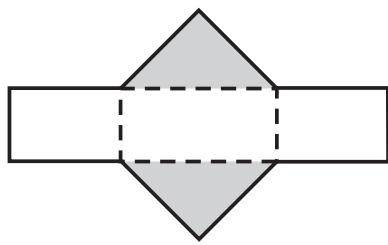
1.



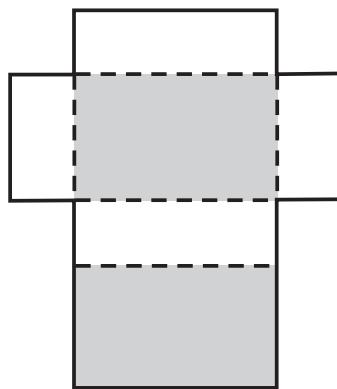
2.



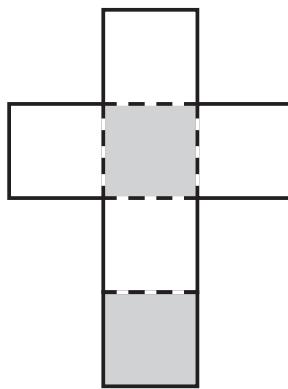
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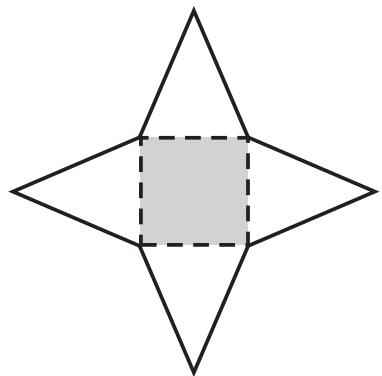
4.



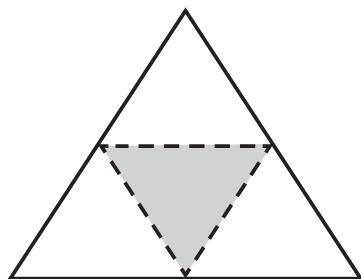
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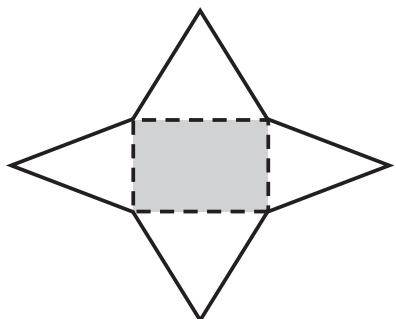
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7.

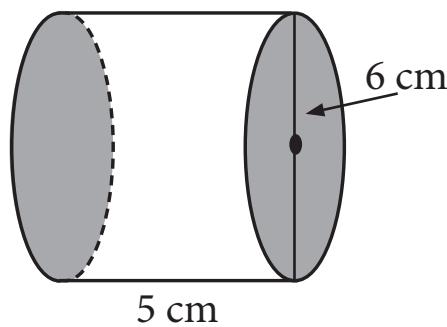
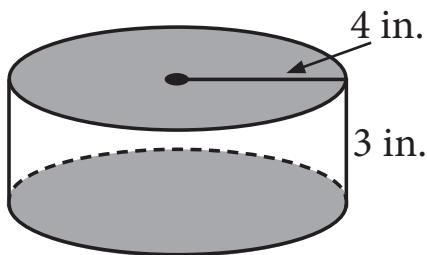
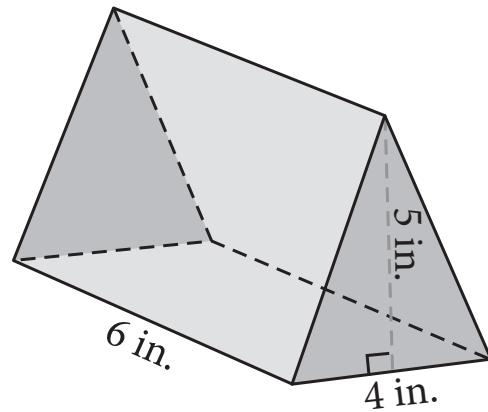
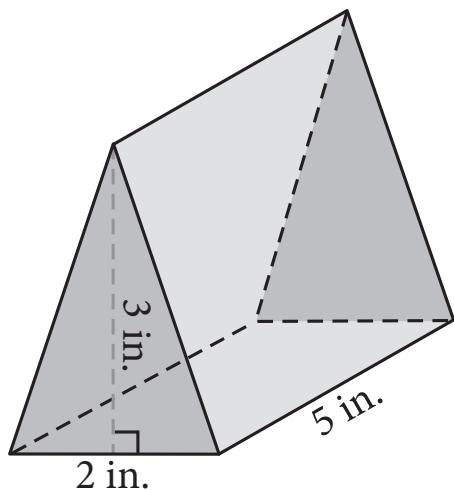


8.



Triangular Prisms & Cylinders

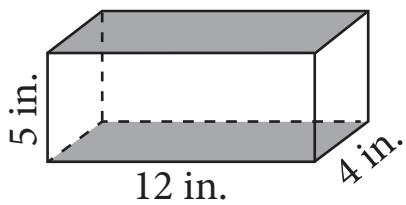
Volume (V) = Area of the base (B) \times height of the prism (h)
$$V = Bh$$



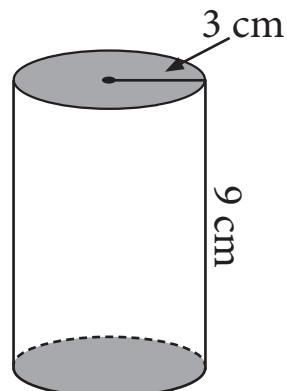
Fixed Volume

Volume Review

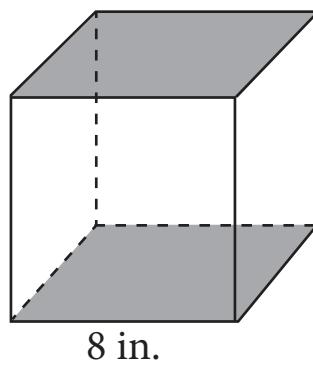
1.



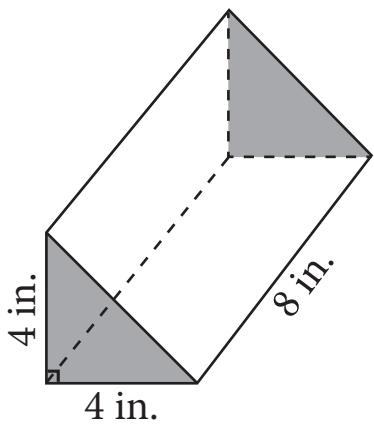
2.



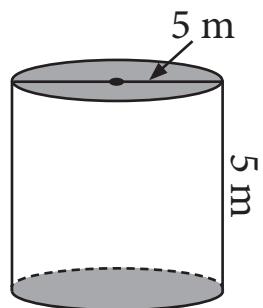
3.



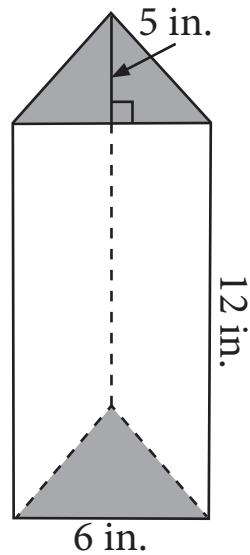
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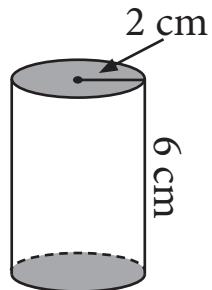
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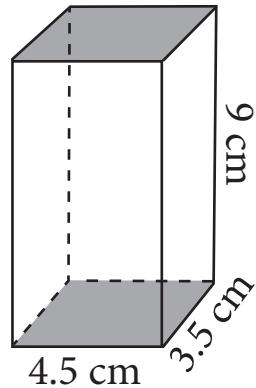
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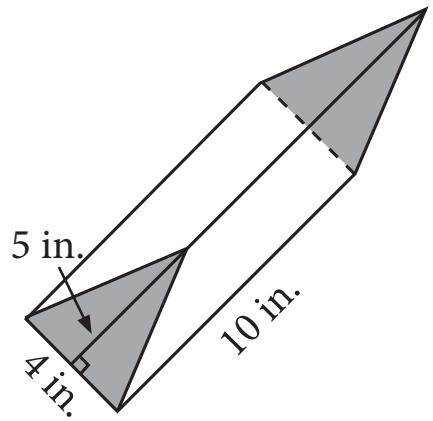
7.



8.



9.



Volume Word Problems

- 1.** The Miller family purchased 4 colorful planters to put on their new deck. All the edges of the red planter are 2 feet in length. How much potting soil did it take to fill the red planter?

- 2.** The Millers purchased a blue planter with a diameter of 2 feet and a height of 2 feet. How much potting soil did it take to fill the blue planter?

- 3.** The Millers bought a yellow planter that is 4 feet long, 2 feet wide, and 1.5 feet high. How much potting soil did it take to fill the yellow planter?

- 4.** The fourth planter is orange with a triangular base and 3 rectangular sides. Two sides of the triangle are each 4 feet long with a height of 2 feet and come together in a 90 degree angle. The height of the planter is also 2 feet. How much potting soil did it take to fill the orange planter?

Dear Parent:

(date)

While studying measurement in math class, the students will be estimating and measuring the length, capacity, and weight/mass of real-life objects. To help with these lessons, please send one or more of the following items to class by _____^(date). Please write your child's name on any item that you would like returned after we have completed the measurement chapter. Items without a name will either be kept in the classroom or be donated to a needy family or a food bank.

Thank you for the objects that you are able to provide.

Sincerely,

A 1-liter bottle of water for each student

A bag of candy, dried beans, apples, or other weighable item

A boxed food item

A canned food item

Waterproof containers of various shapes and sizes: 1 cup, 1 pint, 1 quart, or 1 gallon

A weighable object that fits in your hand (e.g., hockey puck)

A length (or a roll) of ribbon

A square or rectangular scarf

A toy that can be reshaped

Math 6, Instructional Aids, Chapter 13



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Math 6, Instructional Aids, Chapter 13

Pictured Ratios



Ratio Tables

Horses	4	6	8		
Trailers	1	1.5	2	3	4

Centimeters	100				
Meters	1	2	3	4	5

Ounces	16				
Pounds	1	2	4	8	16

Tax					
Purchase					

Earth Weight (pounds)	100	60	40	20	10
Mars Weight (approx. pounds)	40	24	16	8	4

Missing Measurements

Similar Figures A and B

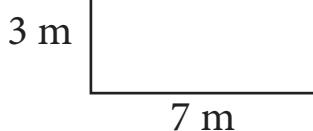


Figure A

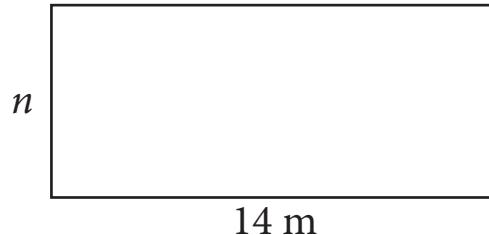


Figure B

Similar Figures C and D

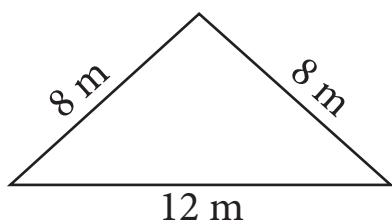


Figure C

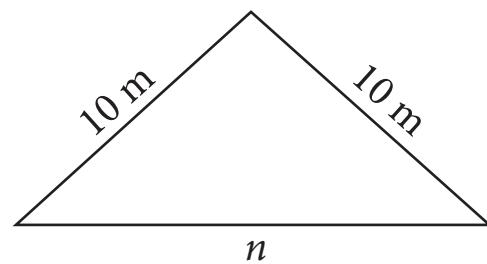


Figure D

Similar Figures E and F

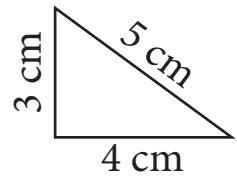


Figure E

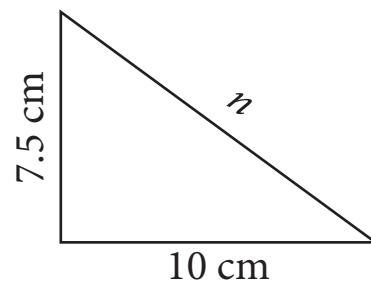
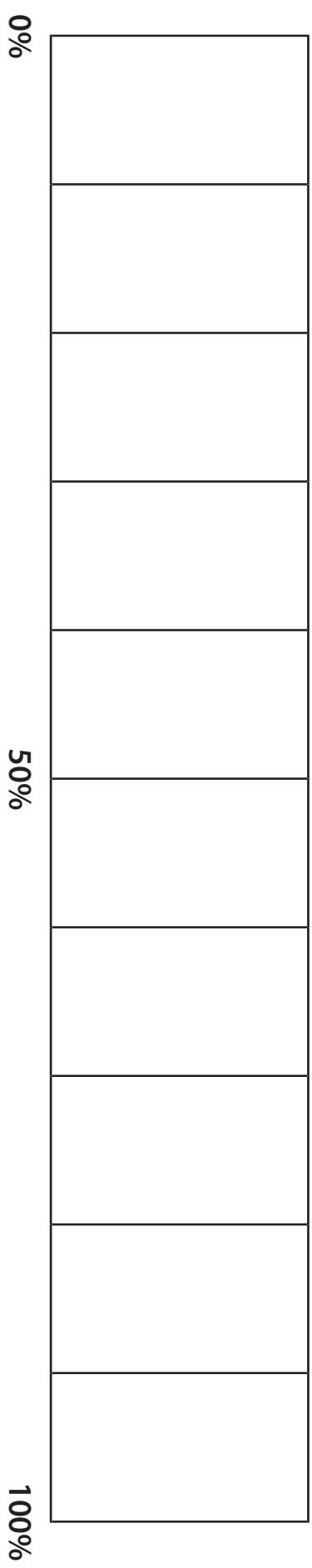
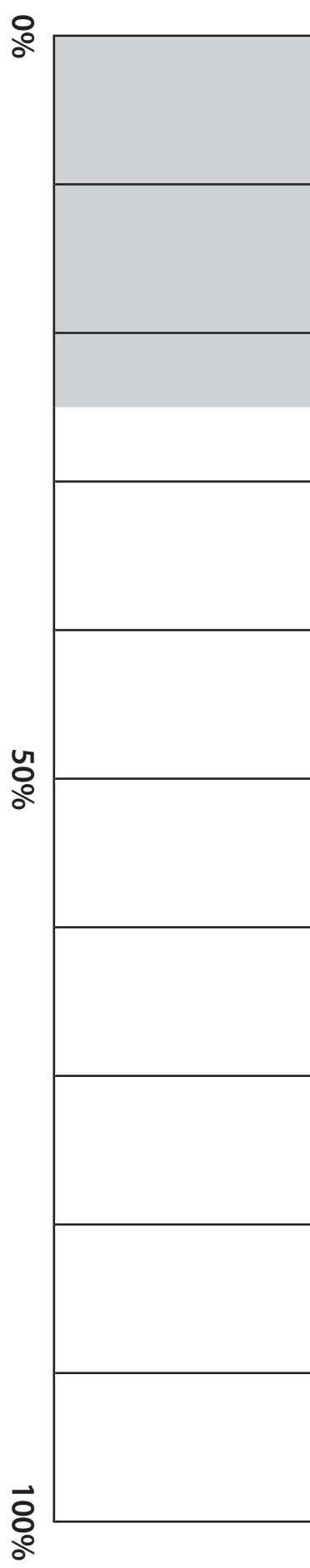
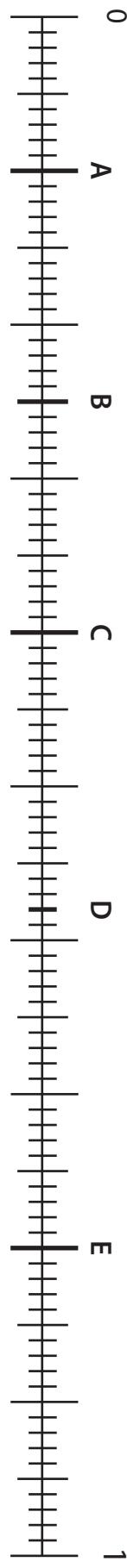


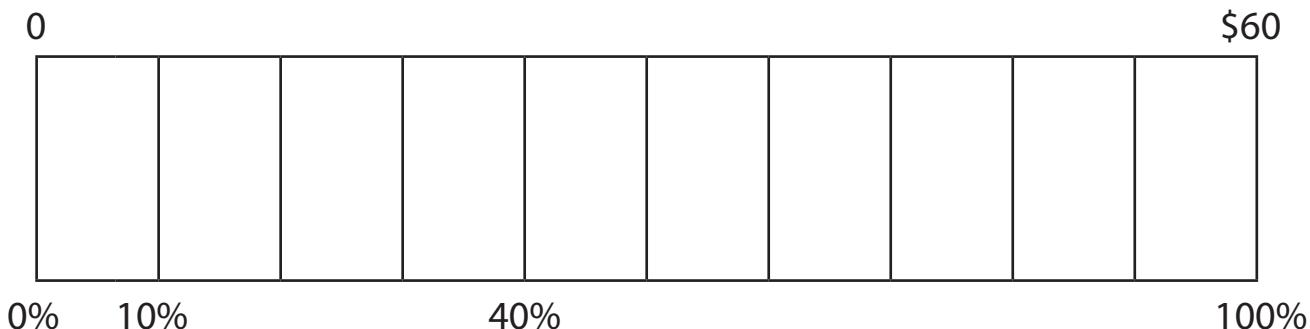
Figure F

Percent

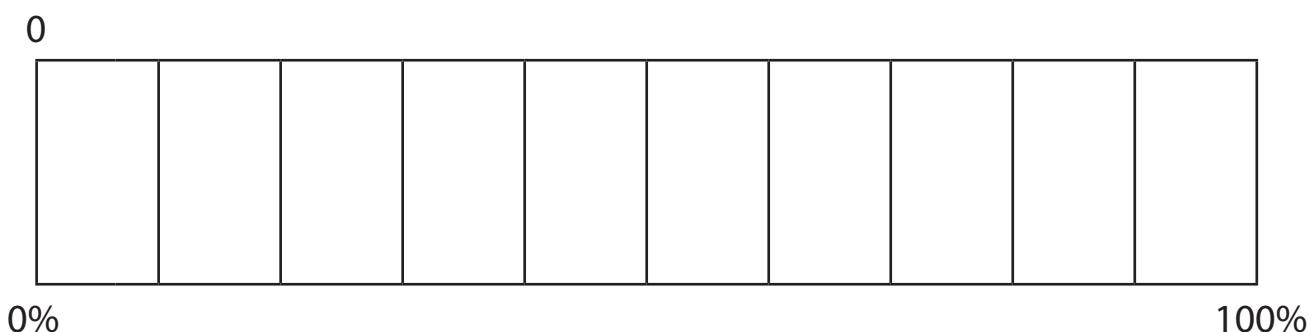


Percent Models: Find the Part

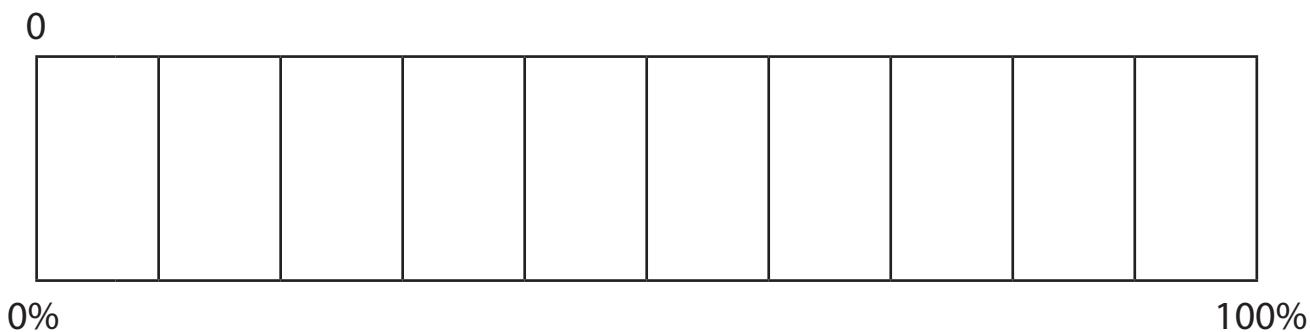
Brad earned \$60. He gave 10% to the church and saved 40%.
How much money did Brad give to the church and save?



Shannon saved 60% of the \$75 she had earned. How much
money did Shannon save?



John purchased a bike during a 30% off sale at the store. The
original price of the bike was \$180. What was the amount of the
discount? What was the sale price?

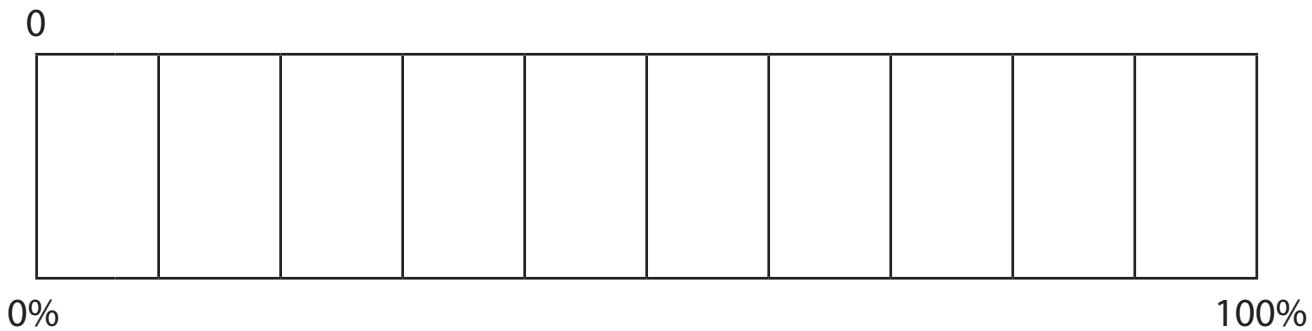


Percent Models: Find the Whole

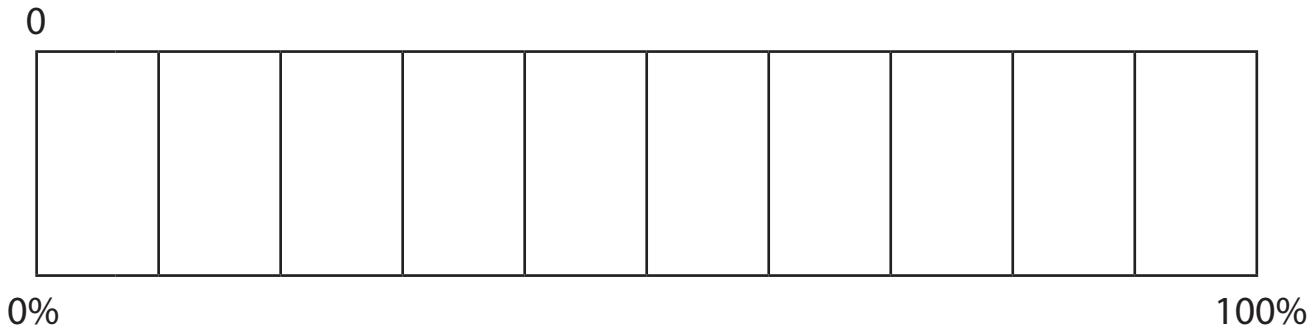
Dori saved \$120 this week. This amount is 60% of the money she earned. What is the total amount that Dori earned this week?



Board games were on sale for 40% off the regular price. Eric received a discount of \$14 on the game he purchased. What was the original price of the board game?

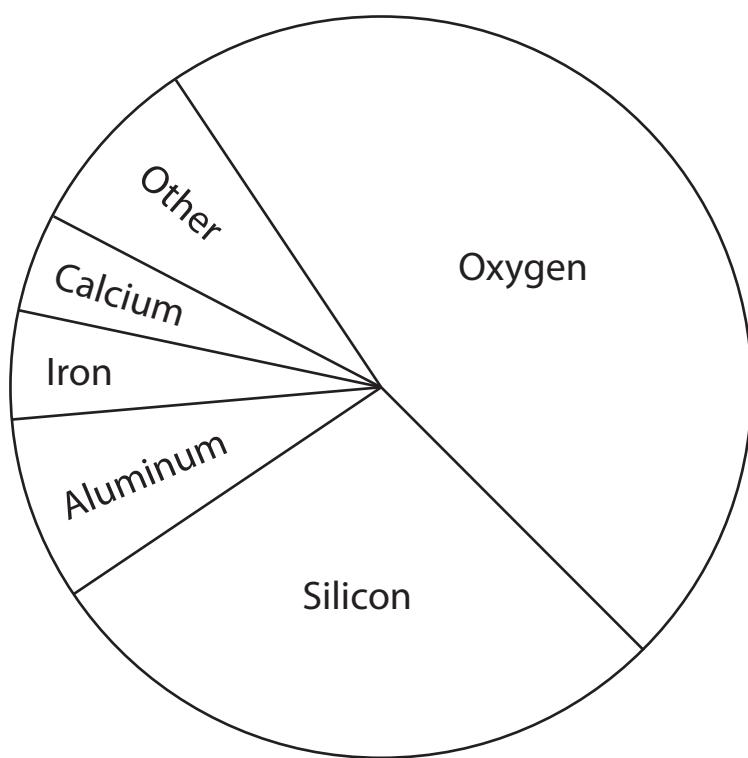


Caleb has earned \$72 for summer camp. He has saved 30% of the amount he needs. What is the total amount of money he needs for camp?



Circle Graph: Elements in the Earth's Crust

Elements	Percent	Ratio (Fraction Form)	Fraction (Lowest Terms)	Decimal
Oxygen	47%			
Silicon	28%			
Aluminum	8%			
Iron	5%			
Calcium	4%			
Other	8%			



Customary Measurement Craze

Measurable Item	Estimate	Measurement

Metric Measure Mania

Item	Meters	Centimeters	Millimeters
estimate			
measurement			
estimate			
measurement			
estimate			
measurement			
estimate			
measurement			
estimate			
measurement			
estimate			
measurement			

Customary Measurement Word Problems

- 1.** The Poole Family raises broiler chickens. They feed the baby chicks starter feed.

Week 1 4 oz of starter feed per chick

Week 2 9 oz of starter feed per chick

Week 3 1 lb 1 oz of starter feed per chick

How much starter feed is needed for 1 chick for the first 3 weeks?

- 2.** One of the Poole's broiler chickens weighs 5 lb 4 oz after seven weeks of intense feeding. One of their laying hens that is the same age weighs 4 lb 8 oz. What is the difference in the weights of the two chickens?

- 3.** The Poole's had 12 baby chicks to raise. How many pounds of starter feed were needed to feed the 12 chicks for the first 3 weeks?

- 4.** The baby chicks were kept in a small square area that is easy to keep warm. The length of the area is 5 ft 8 in. What is its perimeter?

- 5.** At the end of seven weeks, the twelve broiler chickens had a total weight of 60 lb 12 oz. What was the average weight of one broiler chicken?

- 6.** The chicks ate half of a 5 lb bag of starter feed. How many pounds of starter feed were eaten? How many ounces of starter feed were eaten?

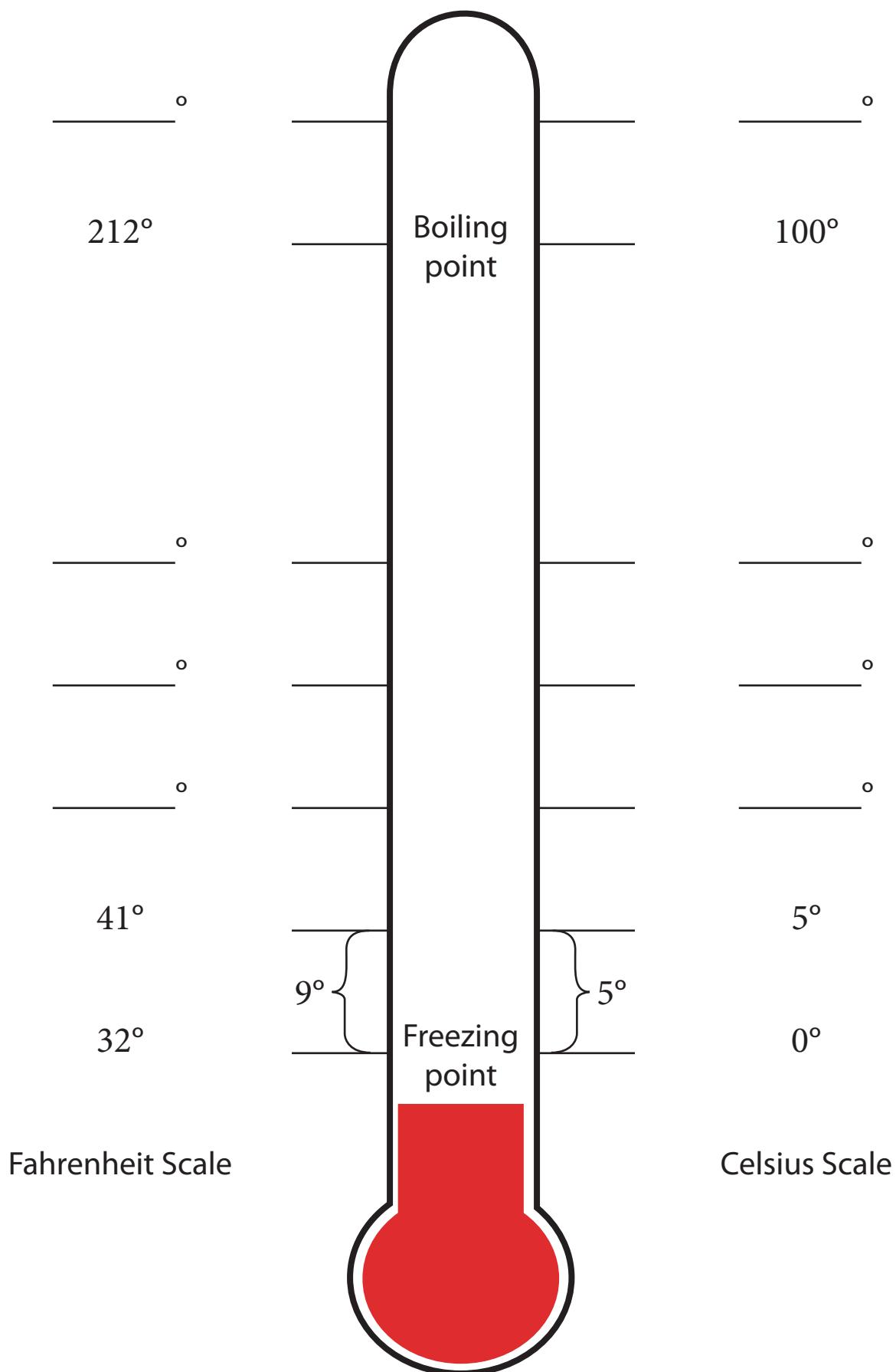
Metric Measurement Word Problems

- 1.** The Poole family raises laying hens. Each chick consumes 5.74 kilograms of chicken feed in seven weeks. How many kilograms of feed should the Poole family purchase for 12 chickens?
- 2.** The Poole family have 24 laying hens. Each laying hen needs 0.5 liters of water each day. How much water do the Poole family need to supply for the hens each day?
- 3.** The Poole family also raises broiler chickens. One of their broiler chickens has a mass of 2.4 kilograms after seven weeks of intense feeding. One of their laying hens that is the same age has a mass of 1.9 kilograms. What is the difference in the masses of the two chickens?
- 4.** At the end of seven weeks, 12 of the Poole's broiler chickens had a total mass of 37.2 kg. What was the average mass of each broiler chicken?
- 5.** The broiler chicks ate two-thirds of a 3.27 kg bag of starter feed. How many kilograms of the starter feed were left? How many grams of the starter feed were left?

Temperature Hunt

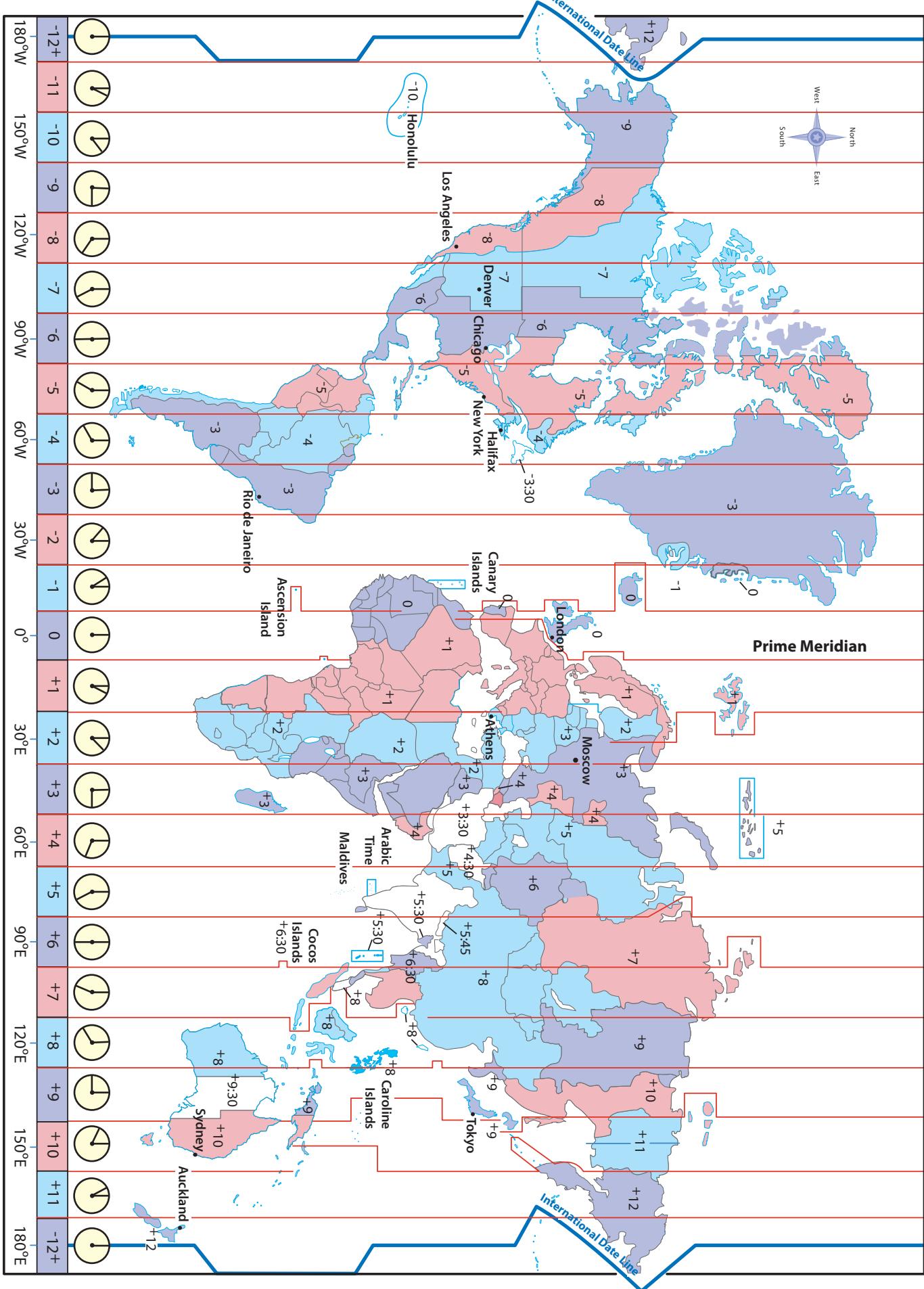
Item	Type of Thermometer	Temperature (°F or °C)	Time

Double-Scale Thermometer



Time Zones of the World

Greenwich Mean Time

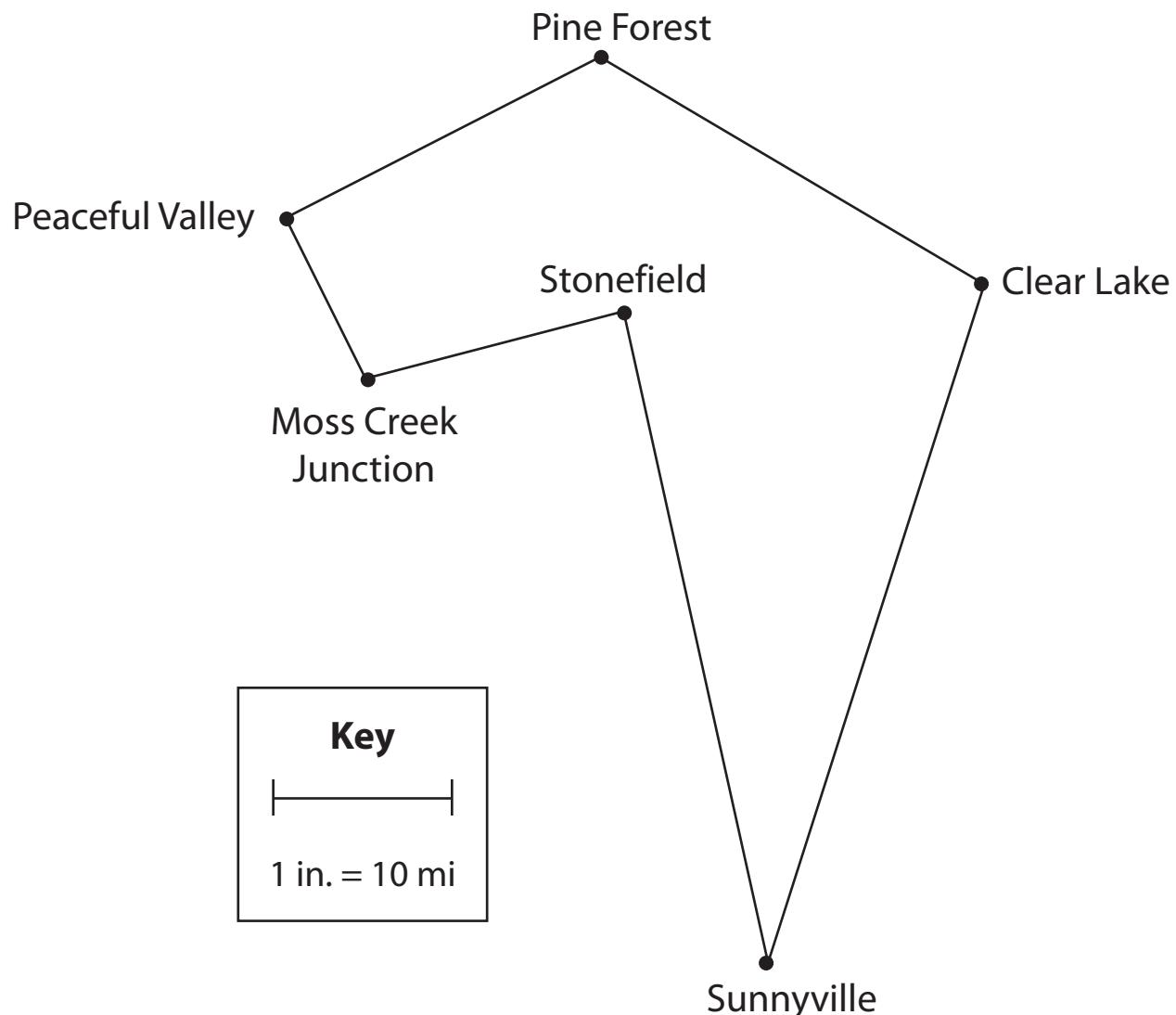


Time Zones

Time Zones of Major Cities				
Greenwich Mean Time	City	Zone	Time	AM/PM
	London			
	Moscow			
	Hong Kong			
	New York			
	Los Angeles			

Americana Airlines Flight Schedule			
Flight	Departure	Arrival	Elapsed Time
Detroit to Atlanta	6:09 AM	7:49 AM	
Detroit to London	7:55 PM	6:25 AM	
Detroit to Houston	6:16 PM	7:44 PM	

Map Key



Distance	Inches	Miles
Peaceful Valley to Stonefield		

Frequency Tables

Spelling Test Scores											
95	93	89	95	100	86	82	98	90	89	95	

Spelling Test Scores											
Score			Tally			Frequency					

range:

mean:

median:

mode:

Daily Low Temperatures							
71°	69°	78°	74°	69°	73°	74°	72°

Daily Low Temperatures							
Temperature			Tally			Frequency	

range:

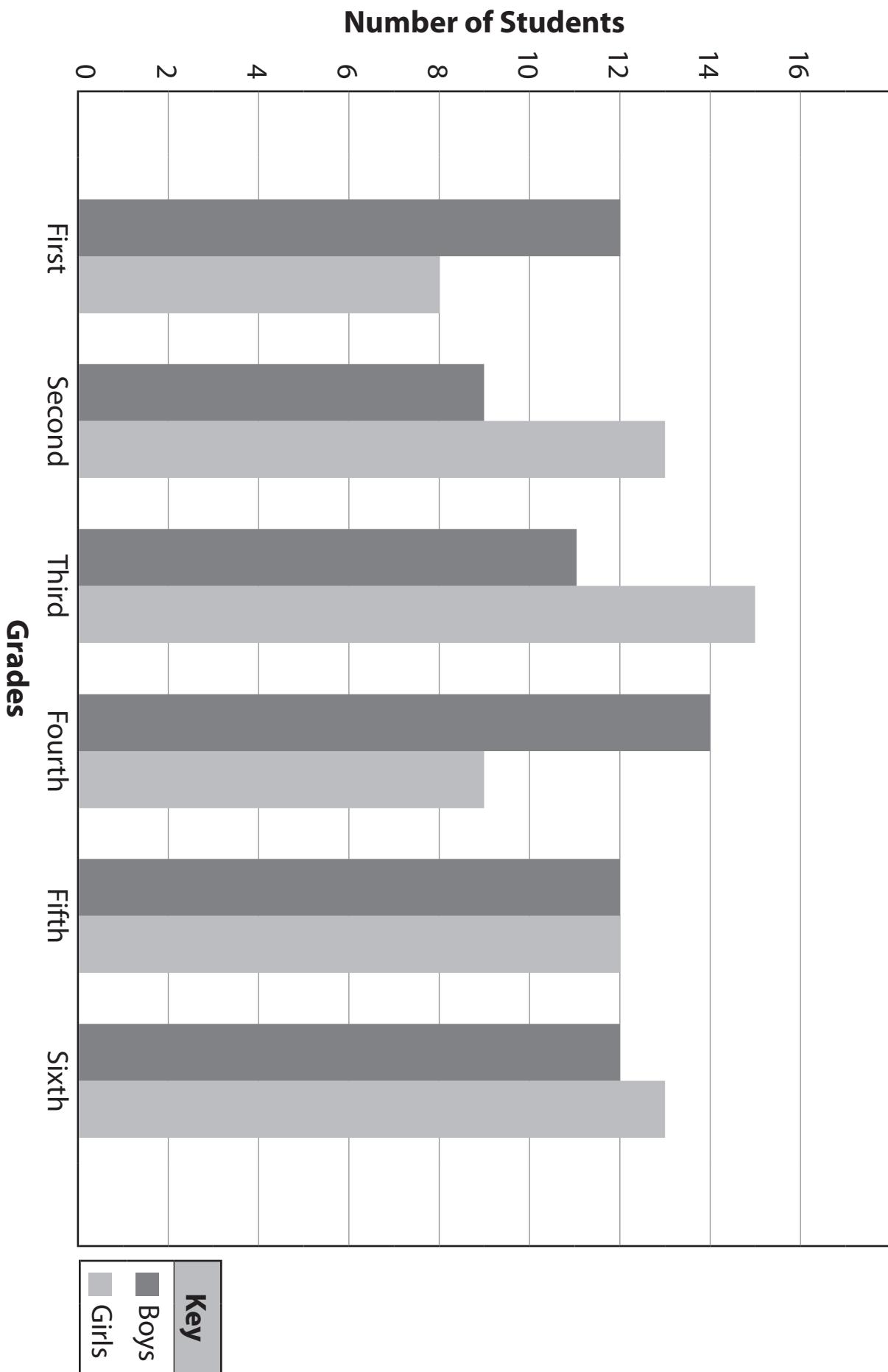
mean:

median:

mode:

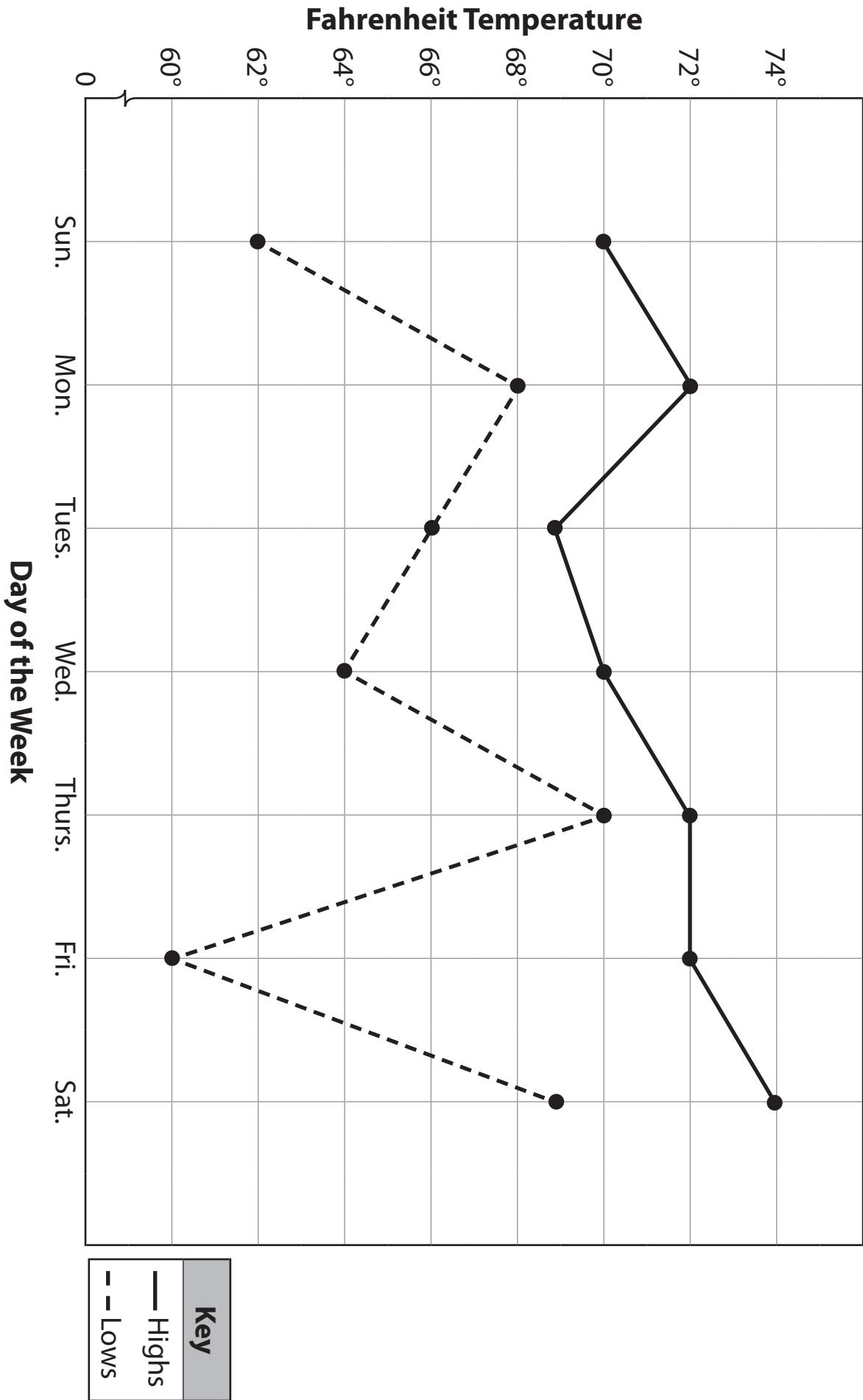
Double Bar Graph

Grace Christian School Attendance



Double Line Graph

Peaceful Valley Temperatures



Stem-and-Leaf Plot

Enrollment at Carter's Christian School	
Stem	Leaf
0	9
1	7 8 9
2	0 0 1 2

Key 1|7 = 17 students

range: _____

median: _____

mode: _____

mean: _____

Stem	Leaf

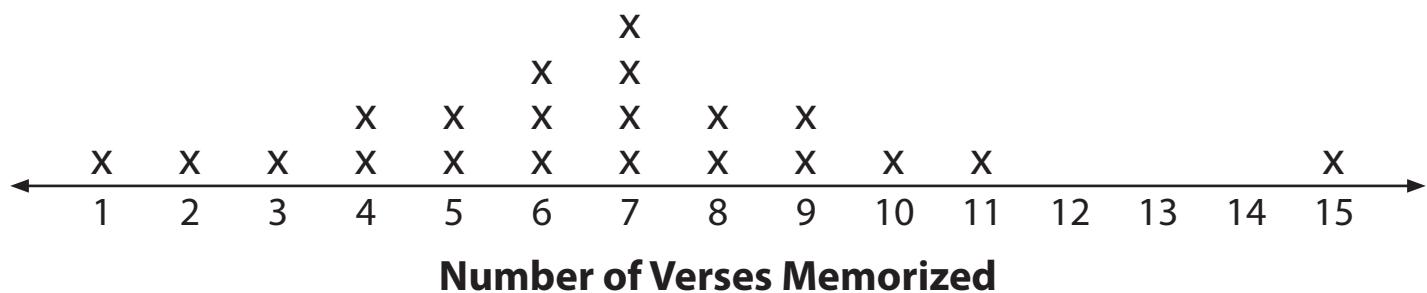
range: _____

median: _____

mode: _____

mean: _____

Line Plot



range: _____

median: _____

mode: _____

mean: _____

without outlier

range: _____

median: _____

mode: _____

mean: _____



Science Test Scores

range: _____

median: _____

mode: _____

mean: _____

without outlier

range: _____

median: _____

mode: _____

mean: _____

Histogram

Ages of Campers: Week 1

11, 10, 12, 10, 11, 12, 15, 8, 9,
12, 11, 12, 13, 11, 15, 8, 9, 9,
8, 12, 9, 12, 14, 12, 13

Ages of Campers: Week 1

Age	Tally	Frequency

(title)

(label)

12
10
8
6
4
2
0

(label)

Box-and-Whisker Plot

Test Scores

data: 89, 76, 91, 82, 95, 98, 85, 80

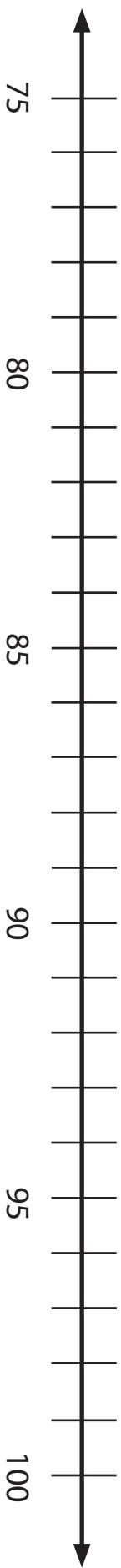
ordered data: 76, 80, 82, 85, 89, 91, 95, 98

middle quartile

(median)

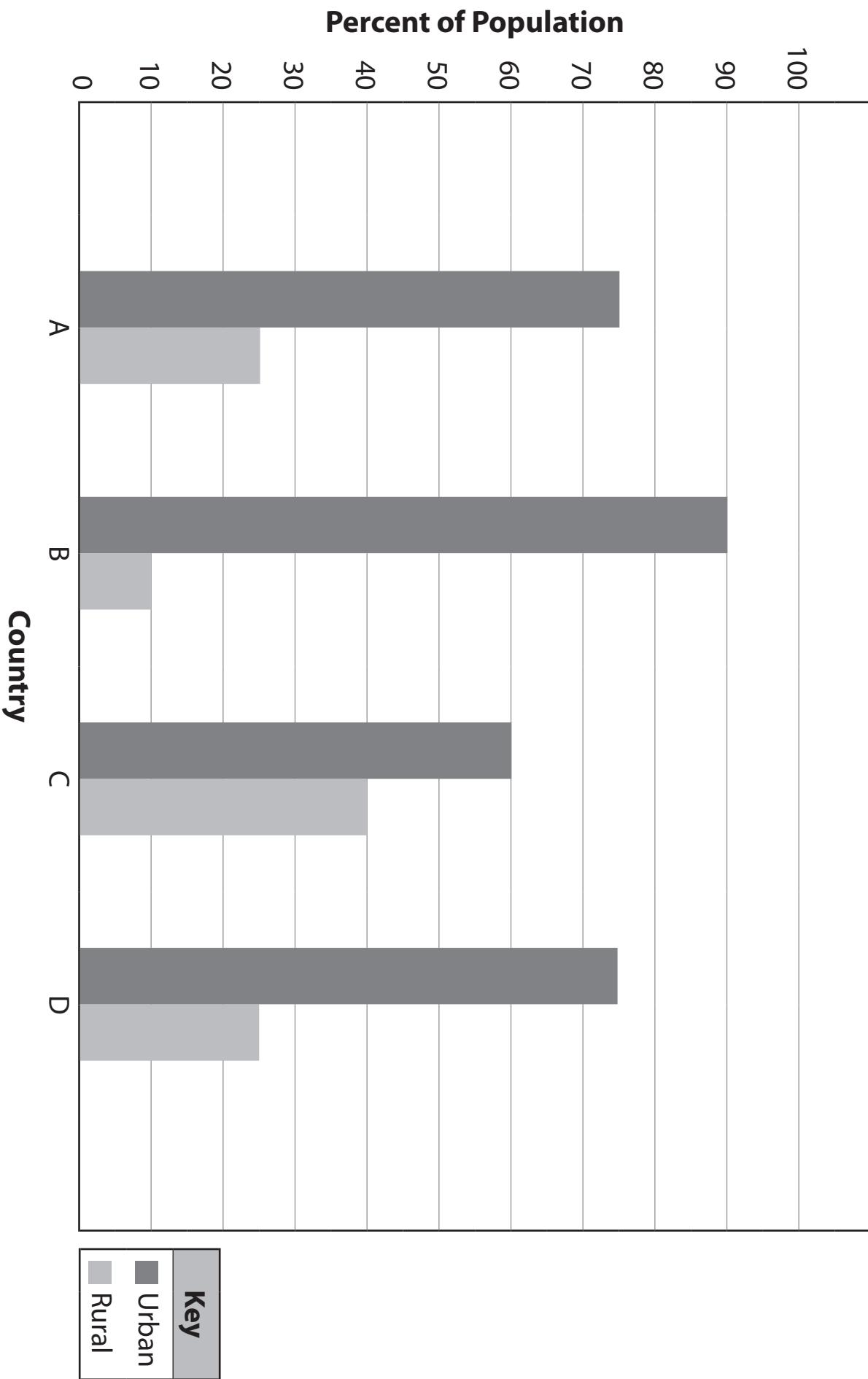
lower quartile
(median of lower half)

upper quartile
(median of upper half)



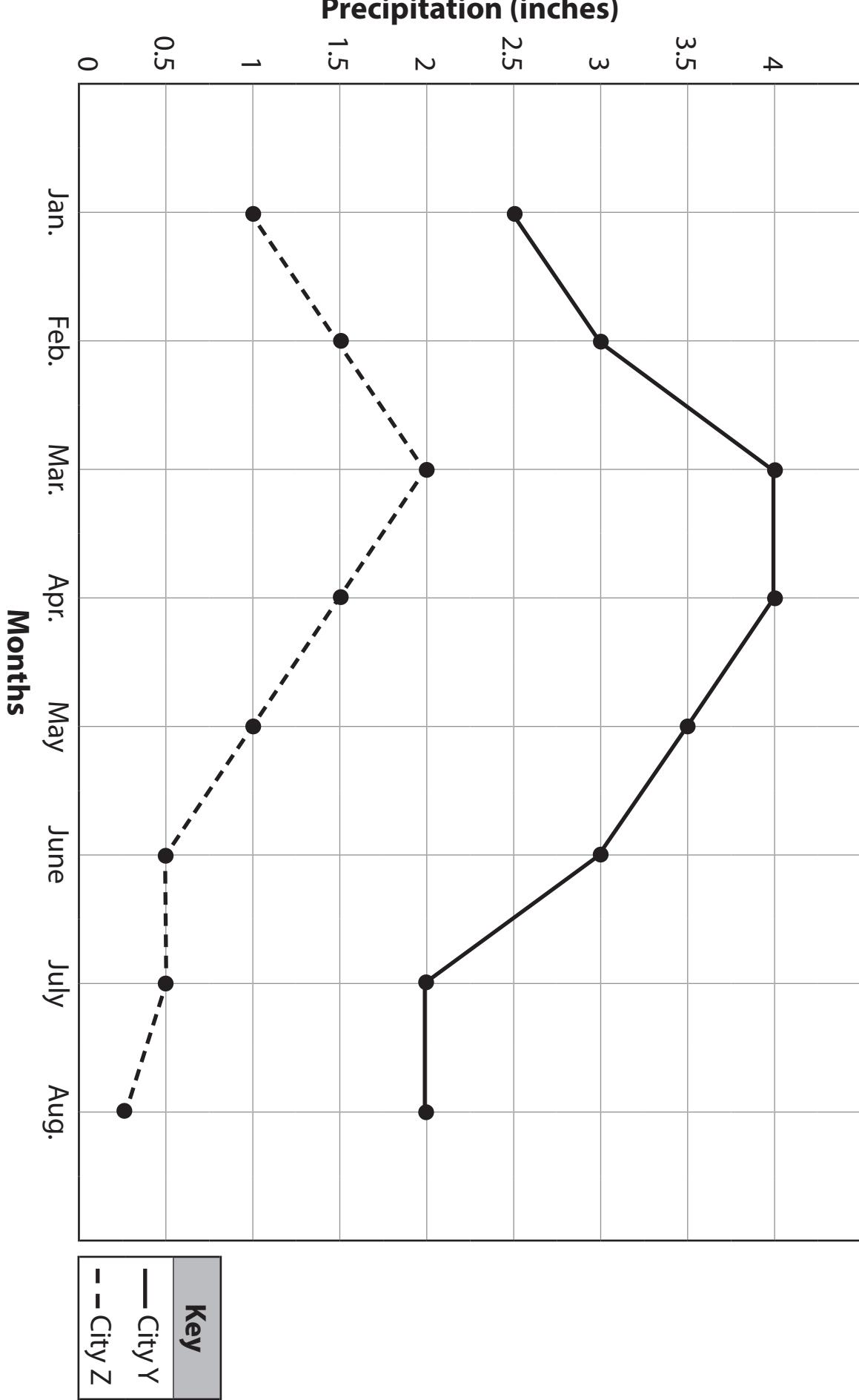
Graph: Double Bar Graph

Population Distribution



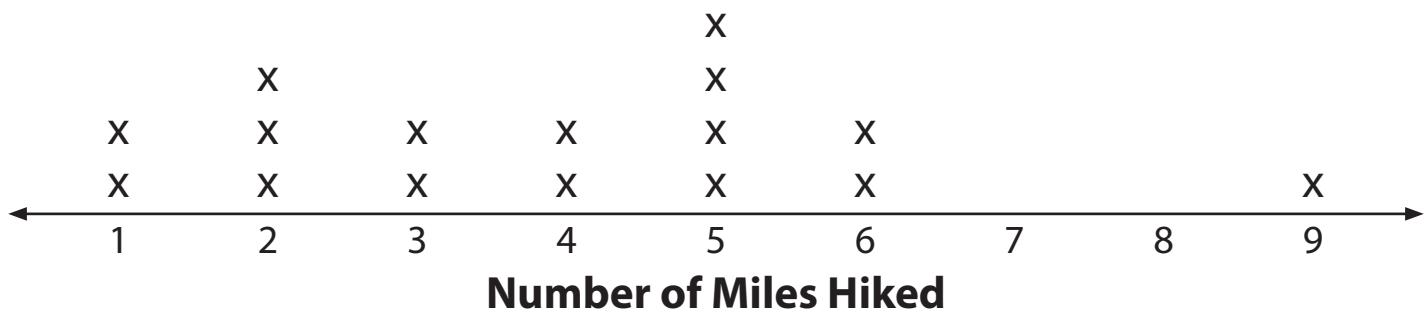
Graph: Double Line Graph

Monthly Precipitation



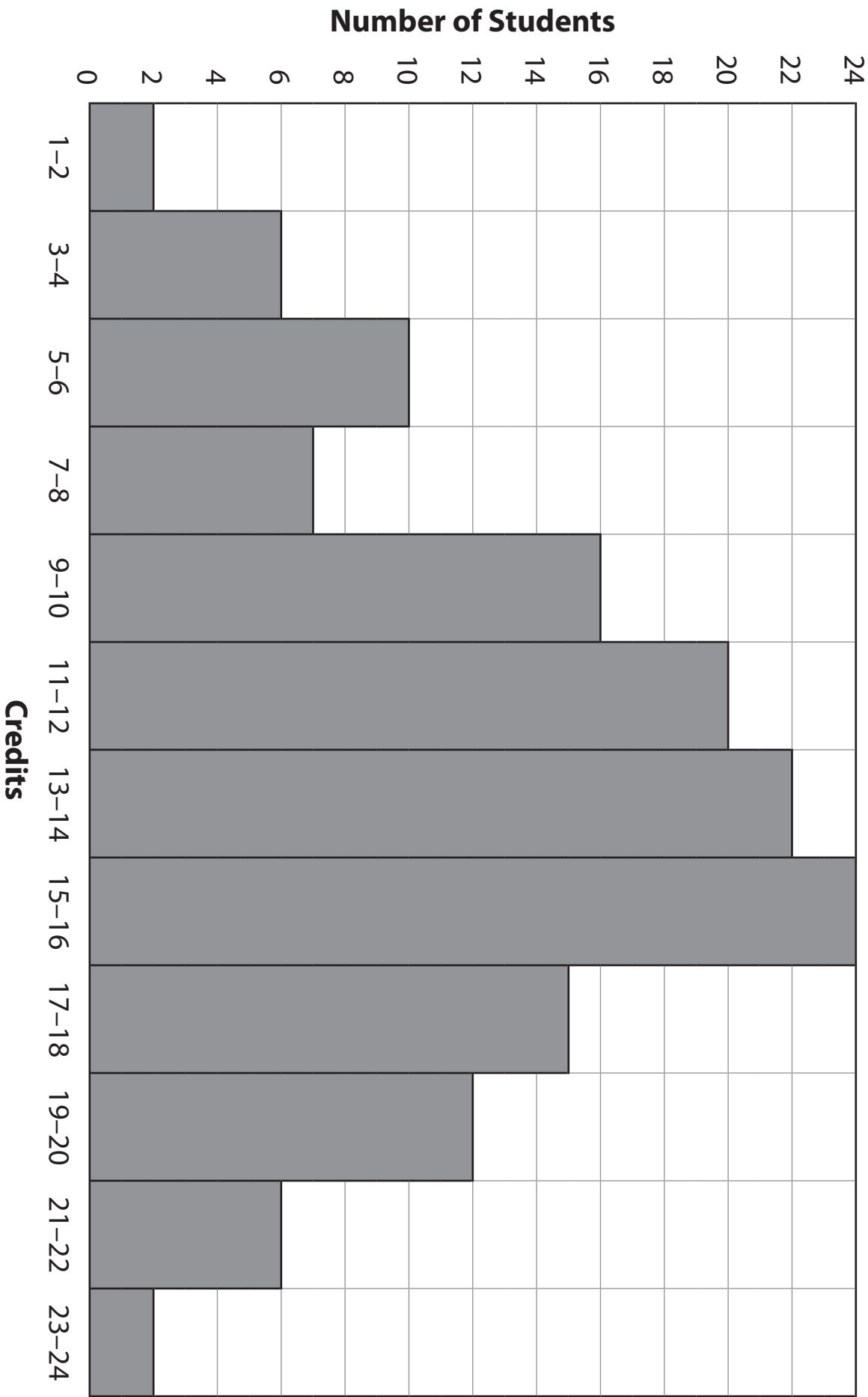
Stem-and-Leaf Plot & Line Plot

Employee Ages	
Stem	Leaf
1	9
2	0 1 2 3 5 7 9 9
3	1 4 4 5 7 7 9
4	2 8 9
5	3 7
6	2



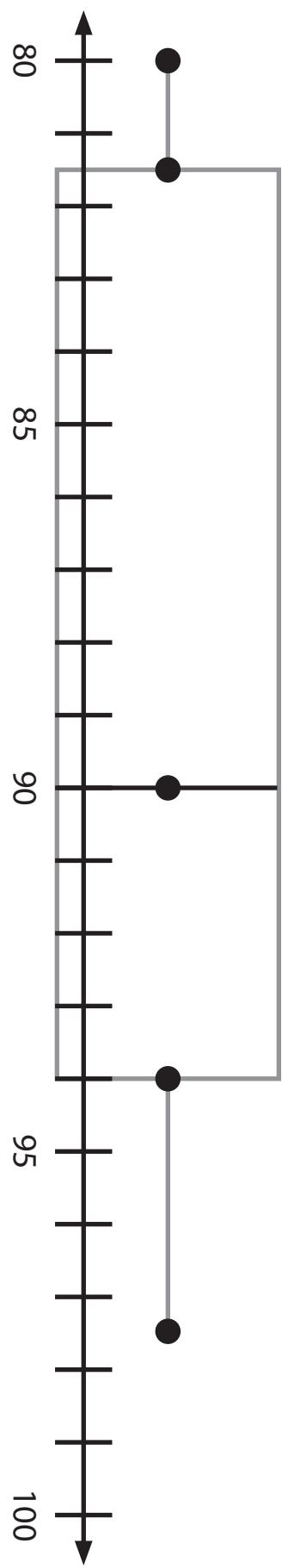
Graph: Histogram

College Junior Class (1st Semester)



Graph: Box-and-Whisker Plot

Science Test 6 Scores



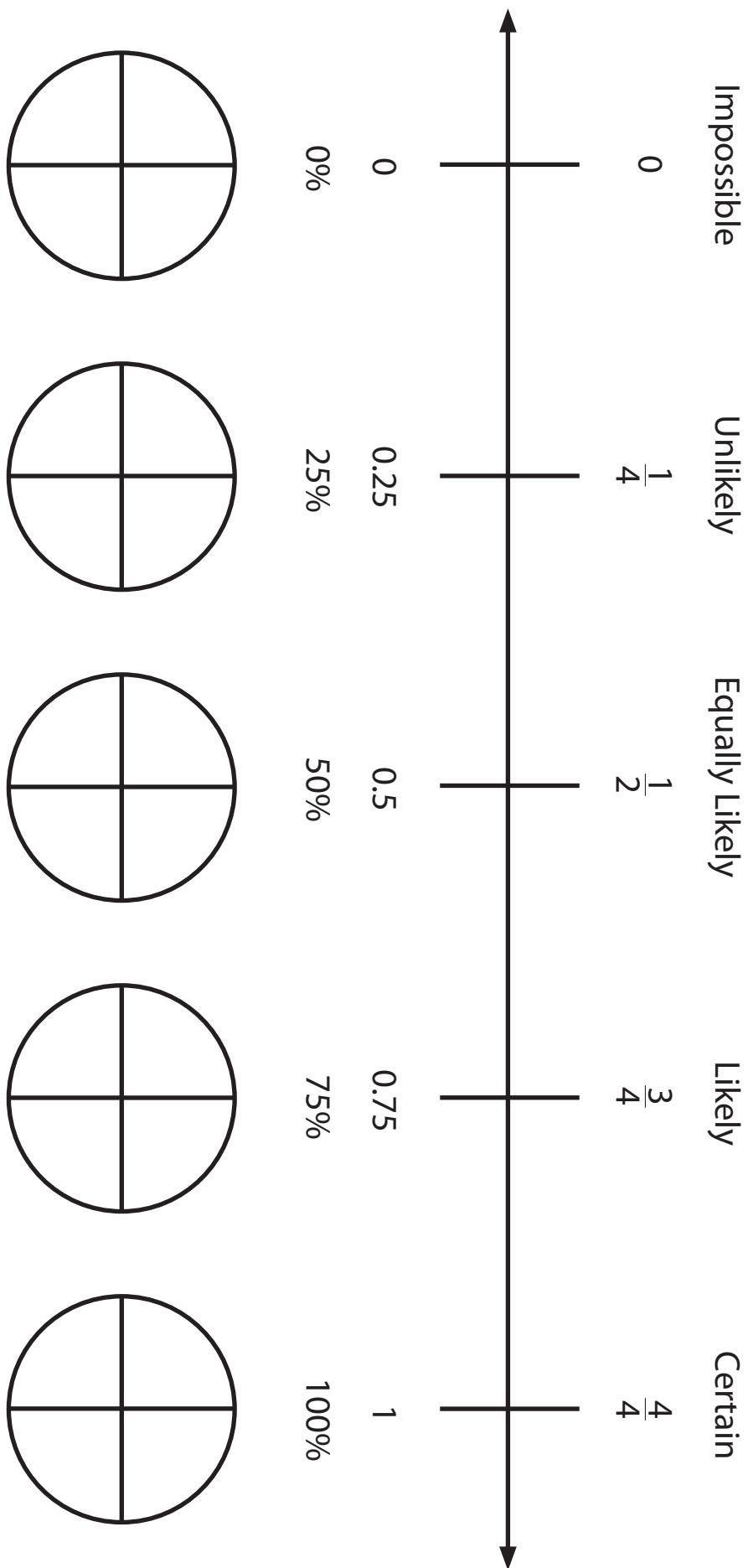
Data

Hours Worked				
Worker	Week 1	Week 2	Week 3	Week 4
Ethan	8	6	10	6
Logan	16	16	10	16
Samuel	10	10	5	6
Zachary	14	10	12	8

Hours	Tally	Frequency

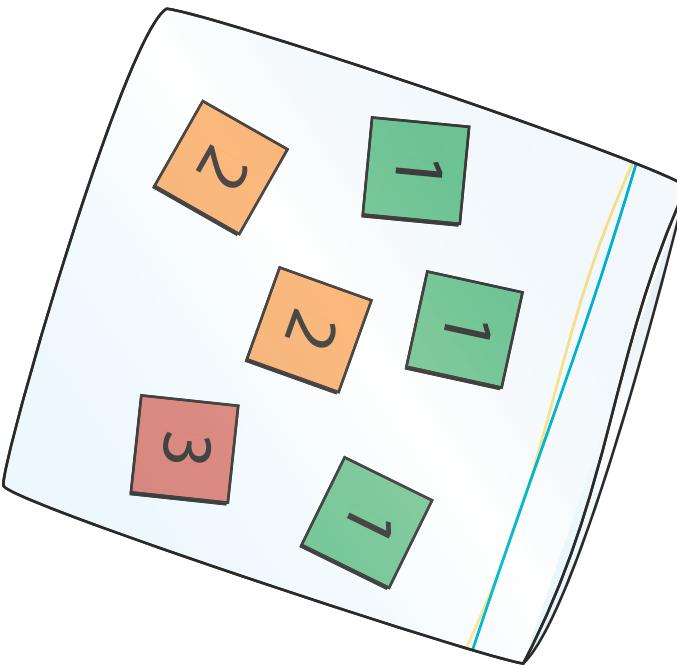
Probability

IA93



Theoretical Probability

$P(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$

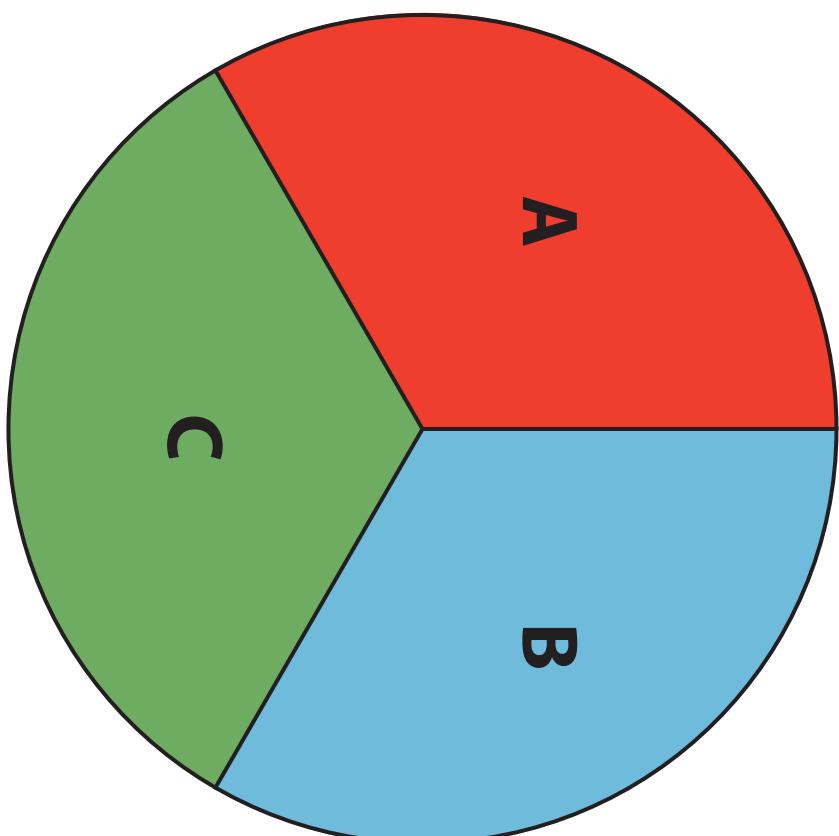


$P(\text{event}) + P(\text{not event}) = 1 \text{ or } 100\%$

P(event)	Probability (fraction)	Probability (decimal)	Probability (percent)
$P(1)$			
$P(\text{not } 1)$			
$P(2)$			
$P(\text{not } 2)$			
$P(3)$			
$P(\text{not } 3)$			

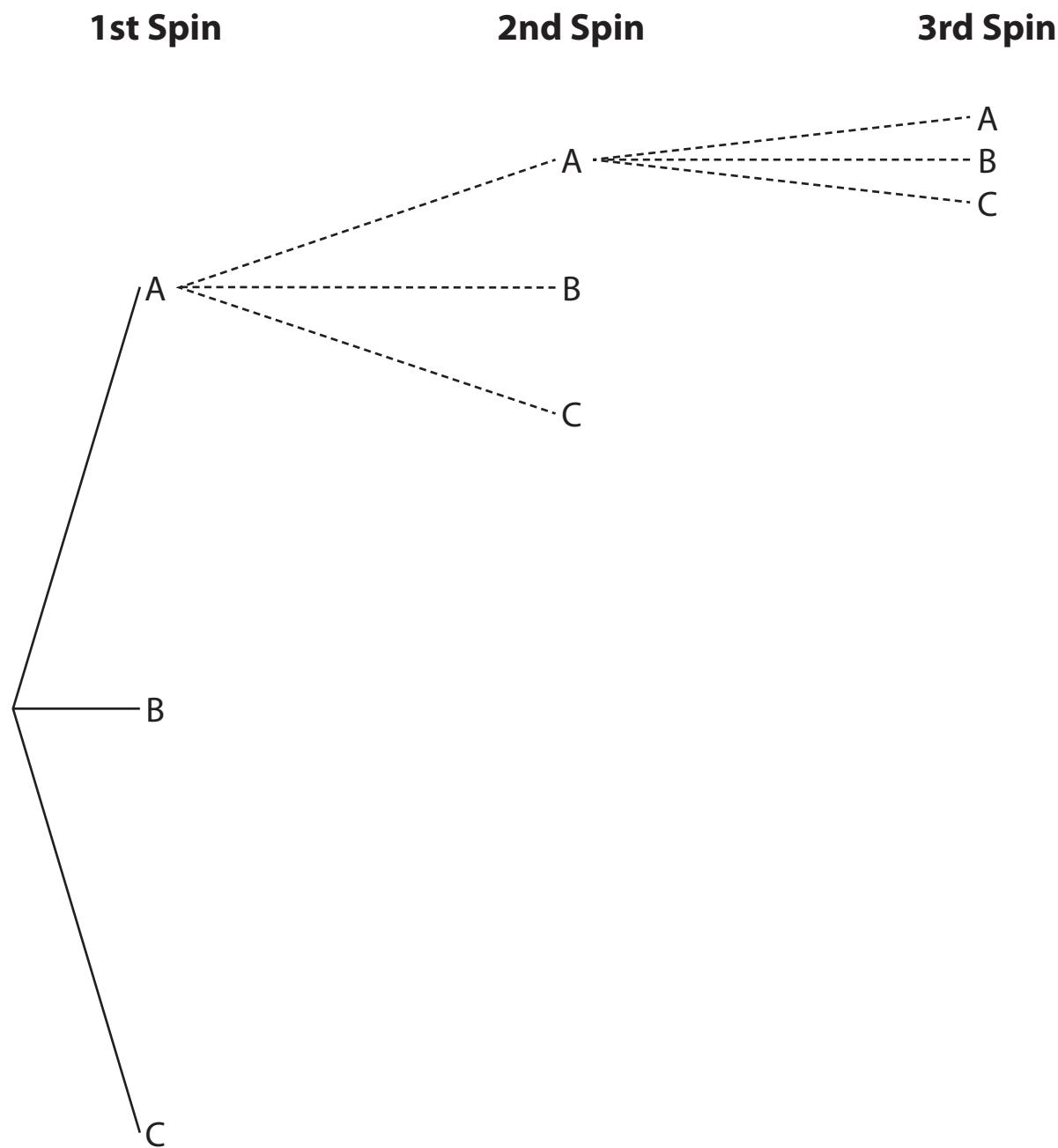
Sample Spaces

IA95



	Sample Space	Number of Possible Outcomes
1 Spin	{A, B, C}	3
2 Spins	{AA, AB, AC, BA, BB, BC, CA, CB, CC}	9
3 Spins	{AAA, AAB, AAC, BAB, BBC, CAB, CCB, CCC}	27

Tree Diagram

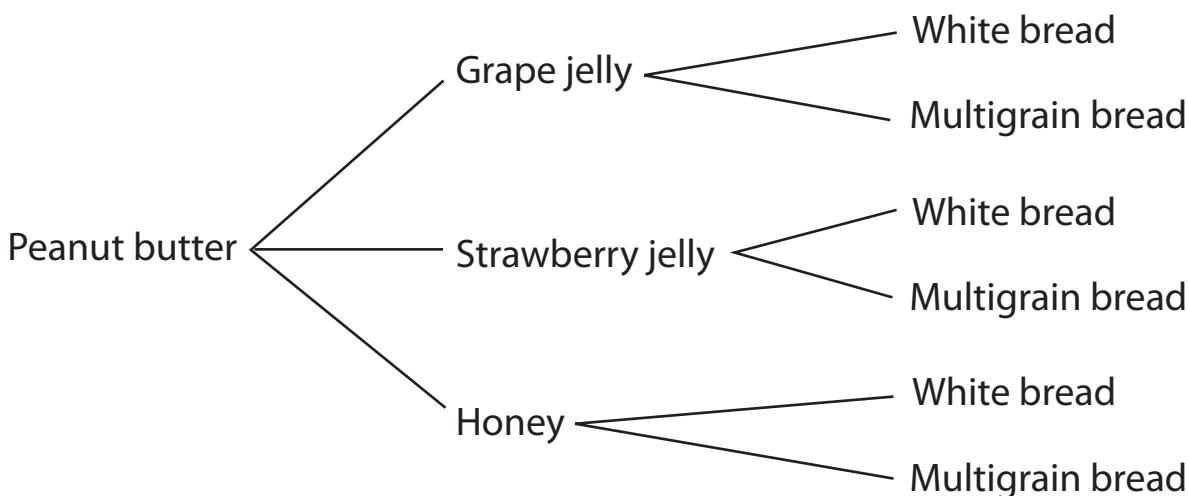


Number of Possible Outcomes

3		
---	--	--

Multiplication Counting Principle

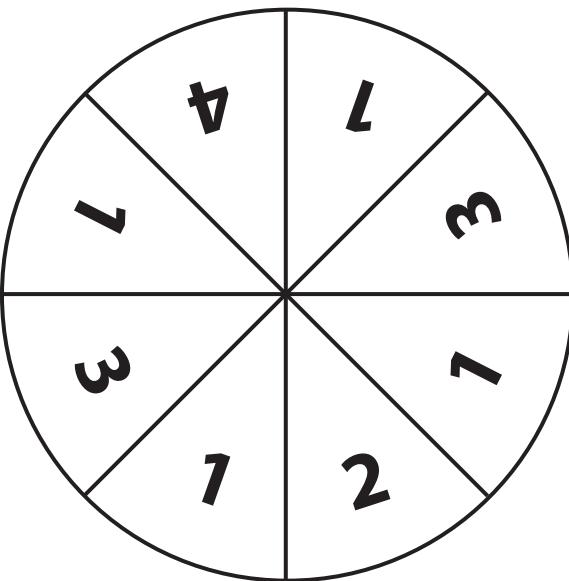
1. Mrs. Fraley is preparing peanut butter sandwiches with grape jelly, strawberry jelly, or honey on either white or multigrain bread. How many possible combinations are there? What is the probability of having a peanut butter sandwich with jelly?



3 spread choices \times 2 bread choices = 6 sandwich combinations

2. Mrs. Parker is making large and small fruit baskets. Each basket has yellow or clear cellophane and has a red, yellow, or blue bow. How many possible combinations are there? What is the probability of having a fruit basket with a red bow?

Experimental Probability



Theoretical Probability	Number of Trials	Expected Results	Actual Results	Experimental Probability
$P(1) =$	16			
$P(2) =$	16			
$P(3) =$	16			
$P(4) =$	16			

Spinner Experiment Results



Spinning Penny Experiment

1. Determine $P(\text{heads})$ and $P(\text{tails})$ for spinning a penny. Write the Theoretical Probabilities in the table.
2. If you spin the penny 20 times, how many times do you expect to spin heads? to spin tails? Write the answers in the Expected Results column of the table.
3. Conduct the experiment: Stand a penny on its side. Holding the top of the penny with a finger on one hand, flick the side of the penny with a finger on your other hand so that the penny spins. When the penny stops spinning, record the result (heads or tails) by placing a tally in the Actual Results column of the table. Repeat the procedure, spinning the penny 20 times.
4. Use the frequency of your Actual Results to determine the Experimental Probability for $P(\text{heads})$ and $P(\text{tails})$.

Theoretical Probability	Number of Trials	Expected Results	Actual Results	Experimental Probability
$P(\text{heads}) =$	20			$P(\text{heads}) =$
$P(\text{tails}) =$	20			$P(\text{tails}) =$



Spinning Penny Experiment

1. Determine $P(\text{heads})$ and $P(\text{tails})$ for spinning a penny. Write the Theoretical Probabilities in the table.
2. If you spin the penny 20 times, how many times do you expect to spin heads? to spin tails? Write the answers in the Expected Results column of the table.
3. Conduct the experiment: Stand a penny on its side. Holding the top of the penny with a finger on one hand, flick the side of the penny with a finger on your other hand so that the penny spins. When the penny stops spinning, record the result (heads or tails) by placing a tally in the Actual Results column of the table. Repeat the procedure, spinning the penny 20 times.
4. Use the frequency of your Actual Results to determine the Experimental Probability for $P(\text{heads})$ and $P(\text{tails})$.

Theoretical Probability	Number of Trials	Expected Results	Actual Results	Experimental Probability
$P(\text{heads}) =$	20			$P(\text{heads}) =$
$P(\text{tails}) =$	20			$P(\text{tails}) =$

Fair or Unfair Games

Two-Cube Sum

1. Predict the sum that will occur most frequently.
2. Roll 2 number cubes. Add the numbers.
3. Draw a tally in the column indicating the sum.
4. Continue rolling the cubes until a number has 10 tallies in a column. The player(s) who predicted the number with 10 tallies wins.

2	3	4	5	6	7	8	9	10	11	12

Is this game fair or unfair? Why?

Two-Cube Even or Odd Sum

1. Predict the number of even sums and the number of odd sums for rolling 2 number cubes 20 times.
2. Roll 2 number cubes. Add the numbers.
3. Draw a tally in the column indicating the sum.
4. Roll the cubes and record the tally 20 times.
5. Total the tallies for even sums and odd sums. The player(s) who predicted most correctly wins.

Even Sum	Odd Sum

Is this game fair or unfair? Why?

Probability Spinner

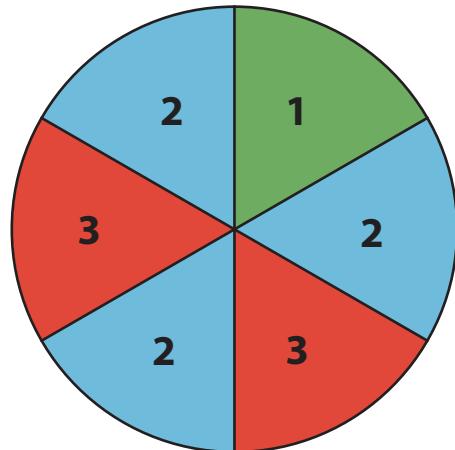
Spin 1, 2, or 3

- Find the Theoretical Probability of spinning each number and write it as a fraction in lowest terms. Use the Theoretical Probability to predict the results you would expect if you spin the paper clip 12 times and record it.
- Spin the paper clip 12 times. Draw tallies to record the frequency in the Actual Results column.
- Write as a fraction in lowest terms the Experimental Probability of spinning each number.

Theoretical Probability	Number of Trials	Expected Results	Actual Results	Experimental Probability
$P(1) =$	12			
$P(2) =$	12			
$P(3) =$	12			

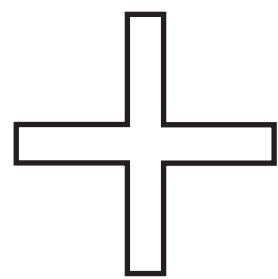
Even or Odd Spin

- Find the Theoretical Probability and predict the Expected Results for spinning an odd or an even number.
- Spin the paper clip.
- Draw a tally in the Actual Results column.
- Spin the spinner and tally the result 19 more times.
- Write the Experimental Probability to complete the chart.

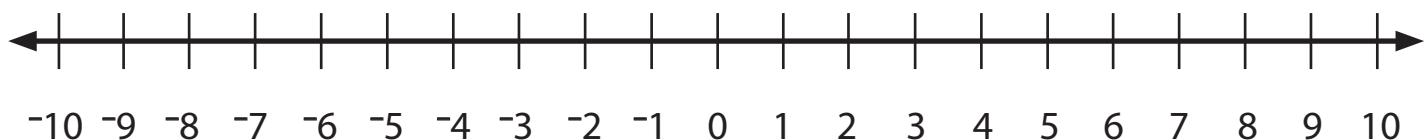
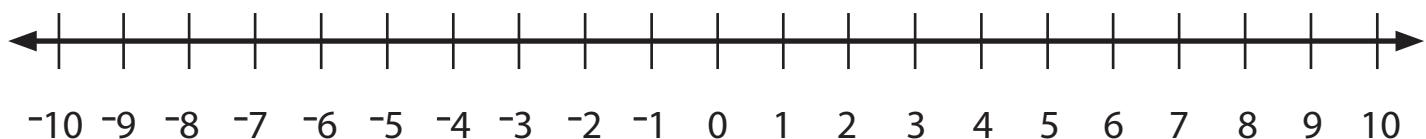
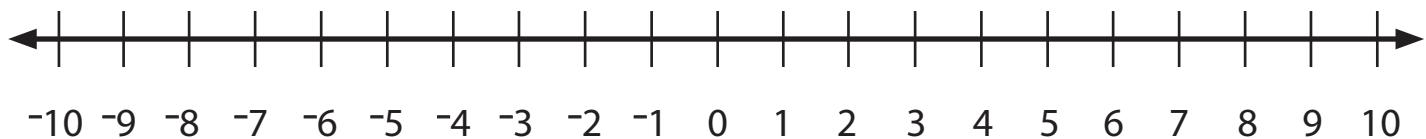
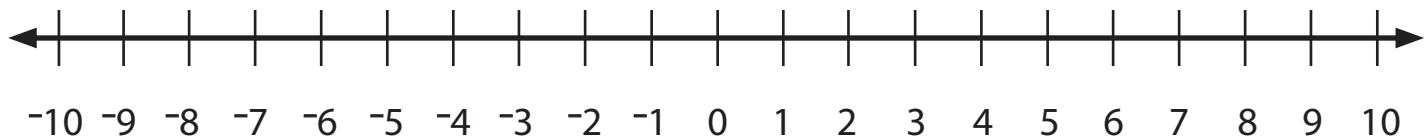


Theoretical Probability	Number of Trials	Expected Results	Actual Results	Experimental Probability
$P(\text{even}) =$	20			
$P(\text{odd}) =$	20			

Would Spin 1, 2, or 3 and Even or Odd Spin make fair or unfair games? Why?



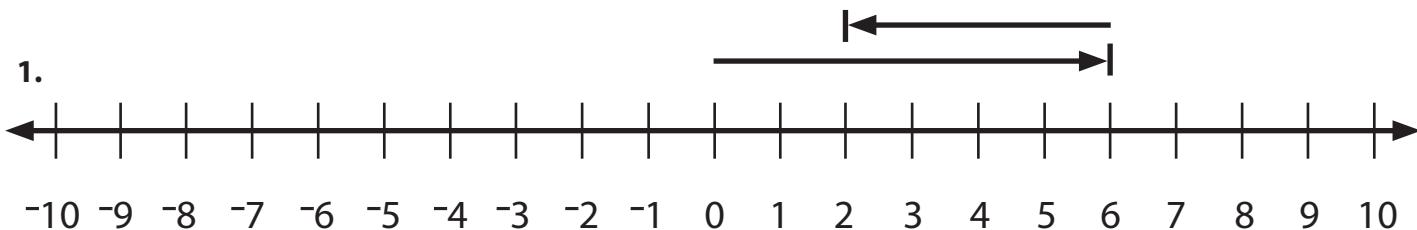
Positive & Negative Number Lines



Subtraction Patterns

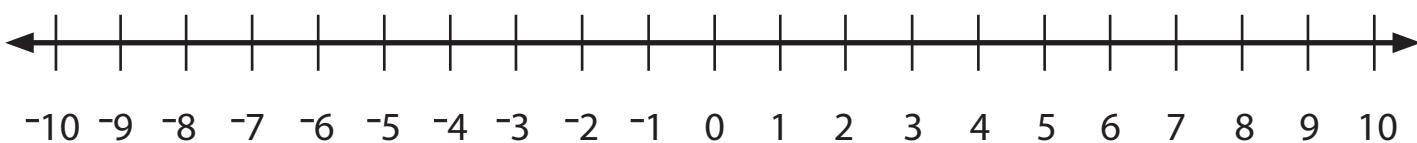
Subtract Integers	Add Integers
<ol style="list-style-type: none">1. Begin at 0 and draw an arrow to the minuend (first number).2. Draw a second arrow: left to subtract a positive number, right to subtract a negative number.3. Final stopping place is the difference.	<ol style="list-style-type: none">1. Begin at 0 and draw an arrow to the first addend.2. Draw a second arrow: right to add a positive number, left to add a negative number.3. Final stopping place is the sum.

1.



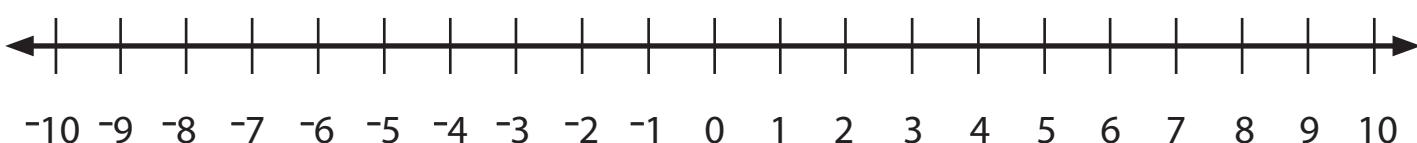
$$6 - 4 = 2$$

2.



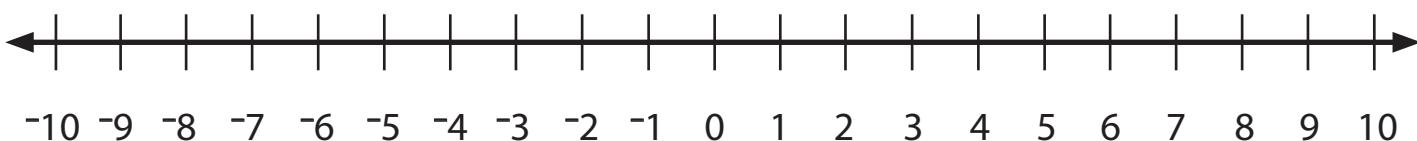
$$-4 - -8 = \underline{\hspace{2cm}}$$

3.



$$3 - -5 = \underline{\hspace{2cm}}$$

4.



$$2 - 6 = \underline{\hspace{2cm}}$$

More Subtraction Patterns

Subtract	Add Opposite
$6 - 3 = 3$	$6 + -3 = 3$
$6 - 2 = 4$	$6 + -2 = 4$
$6 - 1 = 5$	$6 + -1 = 5$
$6 - 0 = 6$	$6 + 0 = 6$
$6 - -1 = 7$	$6 + 1 = 7$
$6 - -2 = \underline{\hspace{1cm}}$	$6 + 2 = \underline{\hspace{1cm}}$

Subtract	Add Opposite
$5 - 1 = 4$	$5 + -1 = 4$
$5 - 2 = 3$	$5 + -2 = 3$
$5 - 3 = 2$	$5 + -3 = 2$
$5 - 4 = 1$	$5 + -4 = 1$
$5 - 5 = 0$	$5 + -5 = 0$
$5 - 6 = \underline{\hspace{1cm}}$	$5 + -6 = \underline{\hspace{1cm}}$

Multiplication Patterns

$$3 \times 3 = 9$$

$$2 \times 3 = 6$$

$$1 \times 3 = 3$$

$$0 \times 3 = 0$$

$$-1 \times 3 = -3$$

$$-2 \times 3 = -6$$

$$-3 \times 3 = \underline{\quad}$$

$$-4 \times 3 = \underline{\quad}$$

$$-4 \times 4 = -16$$

$$-4 \times 3 = -12$$

$$-4 \times 2 = -8$$

$$-4 \times 1 = -4$$

$$-4 \times 0 = 0$$

$$-4 \times -1 = 4$$

$$-4 \times -2 = 8$$

$$-4 \times -3 = \underline{\quad}$$

$$-4 \times -4 = \underline{\quad}$$

Order of Operations

1. Do operations in parentheses first.
2. Find the value of exponents.
3. Multiply and divide from left to right.
4. Add and subtract from left to right.

1. $-8 + 2 - 3 =$

2. $-1 + 16 \div -3 =$

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

4. $-4 - 1 + -3 =$

5. $(3 - 2) + (-4 + -2) =$

6. $-15 \div 3 + -2 =$

7. $2(-12 \div -6) =$

8. $3 \times 3 + -2 =$

9. $14 - (-4 + 2) =$

10. $7^2 + (-16 \div 2) =$

Mental Math Problems

4-number strands

$$\begin{aligned}12 + 2 \div 7 + 4 &= 6 \\5 \times 8 \div 10 + 6 &= 10 \\26 + 2 \div 4 - 3 &= 4 \\16 + 4 \div 5 + 1 &= 5 \\3 \times 5 + 10 \div 5 &= 5 \\35 + 10 \div 5 \times 3 &= 27 \\4 \times 11 - 4 \div 5 &= 8 \\7 \times 9 - 9 - 4 &= 50 \\2 \times 4 - 8 + 3 &= 3 \\6 + 2 \times 4 + 3 &= 35 \\5 \times 6 \div 3 + 7 &= 17 \\8 \div 2 \times 6 \div 3 &= 8 \\10 - 3 \times 3 + 4 &= 25 \\30 - 10 \div 5 + 6 &= 10 \\66 \div 11 \times 7 - 2 &= 40 \\18 \div 3 + 7 + 3 &= 16 \\9 + 8 + 4 \div 7 &= 3 \\2 + 20 \div 11 \times 3 &= 6 \\4 \times 9 \div 6 \times 8 &= 48 \\5 \times 9 + 3 \div 6 &= 8\end{aligned}$$

5-number strands

$$\begin{aligned}2 \times 7 + 8 + 3 \div 5 &= 5 \\6 + 8 + 10 \div 3 + 5 &= 13 \\9 \times 6 - 9 \div 5 - 2 &= 7 \\56 \div 7 \times 8 \div 8 + 0 &= 8 \\23 - 5 \div 3 + 4 \div 1 &= 10 \\16 \div 4 \times 9 + 5 - 4 &= 37 \\3 \times 9 + 20 - 9 + 5 &= 43 \\7 \times 6 + 9 - 1 \div 10 &= 5 \\4 \times 7 - 4 \div 6 + 9 &= 13 \\7 \times 9 - 8 \div 5 - 4 &= 7 \\9 + 2 \times 7 - 14 \div 9 &= 7 \\9 \times 8 - 5 + 3 \div 7 &= 10 \\43 + 7 \div 10 - 3 \times 4 &= 8 \\16 + 9 \div 5 + 7 \div 2 &= 6 \\29 - 8 + 7 \div 4 + 5 &= 12 \\9 + 7 + 4 \div 2 \times 6 &= 60 \\20 + 13 \div 11 \times 6 \div 9 &= 2 \\4 \times 8 + 4 \div 6 \times 8 &= 48 \\56 \div 8 \times 9 + 3 \div 6 &= 11 \\10 \times 10 - 10 \div 10 \times 7 &= 63\end{aligned}$$

4-number strands

$$\begin{aligned}3 \times 8 \div 4 + 7 &= 13 \\8 \div 1 \times 6 \div 4 &= 12 \\9 - 3 \times 7 + 4 &= 46 \\75 - 3 \div 8 + 1 &= 10 \\36 \div 12 \times 4 - 4 &= 8 \\30 \div 3 + 4 + 8 &= 22 \\7 + 8 - 4 + 7 &= 18 \\12 + 8 \times 3 \div 6 &= 10 \\4 \times 7 - 6 \div 11 &= 2 \\3 \times 9 + 3 \div 6 &= 5 \\12 + 10 \div 2 + 4 &= 15 \\5 \times 5 + 10 \div 7 &= 5 \\28 + 2 \div 6 - 3 &= 2 \\7 + 4 + 5 - 1 &= 15 \\3 \times 7 + 9 \div 5 &= 6 \\45 + 10 \div 5 \times 3 &= 33 \\4 \times 8 - 4 \div 4 &= 7 \\7 \times 7 - 9 \div 4 &= 10 \\2 \times 9 - 8 + 3 &= 13 \\8 + 2 \times 4 \div 8 &= 5\end{aligned}$$

5-number strands

$$\begin{aligned}6 \times 6 - 7 + 5 + 4 &= 38 \\9 + 7 \div 4 + 6 \div 5 &= 2 \\9 \times 9 - 6 - 3 \div 9 &= 8 \\34 + 8 \div 7 \times 3 + 4 &= 22 \\9 + 9 \div 6 + 12 \div 5 &= 3 \\9 - 8 + 6 \times 2 + 5 &= 19 \\4 + 7 + 4 \div 3 \times 7 &= 35 \\20 + 8 \div 4 \times 6 - 6 &= 36 \\4 \times 8 + 10 \div 6 \times 8 &= 56 \\64 \div 8 \times 9 + 3 - 15 &= 60 \\10 \times 3 - 10 \div 10 \times 9 &= 18 \\3 \times 3 + 8 + 1 \div 2 &= 9 \\6 + 7 + 2 \div 3 + 5 &= 10 \\4 \times 6 - 9 \div 5 - 2 &= 1 \\54 \div 9 \times 2 \div 2 + 9 &= 15 \\37 - 5 \div 8 + 7 \div 11 &= 1 \\16 \div 2 \times 9 - 2 \div 7 &= 10 \\3 \times 4 + 2 - 9 + 8 &= 13 \\7 \times 1 + 9 \div 4 \times 9 &= 36 \\4 \times 4 - 8 \div 2 + 9 &= 13\end{aligned}$$

More Mental Math Problems

6-number strands

$$\begin{aligned}12 - 7 + 2 \times 4 \div 4 + 3 &= 10 \\5 \times 5 \times 4 \div 10 + 6 \div 4 &= 4 \\30 + 2 \div 4 - 3 \times 9 + 0 &= 45 \\11 + 4 \div 5 + 10 - 1 \times 3 &= 36 \\1 + 5 \times 10 \div 12 \times 2 - 1 &= 9 \\53 + 10 \div 7 \times 3 + 3 \div 3 &= 10 \\3 \times 11 - 3 \div 6 + 2 \times 4 &= 28 \\7 + 9 \div 4 + 6 \times 6 - 12 &= 48 \\2 \times 4 + 9 + 3 \times 4 - 3 &= 77 \\6 \div 2 \times 11 + 3 \div 9 + 2 &= 6 \\5 \times 8 \div 2 + 7 \div 3 \times 2 &= 18 \\10 \div 2 \times 1 + 13 \div 9 + 7 &= 9 \\10 - 7 \times 3 + 1 \div 2 \times 7 &= 35 \\70 - 10 \div 6 + 4 \div 2 \times 8 &= 56 \\56 \div 8 \times 7 + 1 \div 5 + 3 &= 13 \\18 \div 6 + 7 \div 2 + 8 - 2 &= 11 \\6 + 8 - 4 \times 7 + 2 \div 9 &= 8 \\4 + 20 \div 6 \times 5 + 1 \div 3 &= 7 \\3 \times 12 \div 6 \times 8 + 2 \div 5 &= 10 \\6 \times 9 + 6 \div 6 \times 2 \div 10 &= 2\end{aligned}$$

6-number strands

$$\begin{aligned}6 - 3 \times 8 \div 2 + 3 \div 5 &= 3 \\8 \div 4 \times 5 + 32 \div 7 \times 9 &= 54 \\9 + 3 \times 2 + 4 \div 7 - 2 &= 2 \\24 - 3 \div 7 \times 9 + 3 \div 1 &= 30 \\48 \div 12 \times 6 - 4 \div 5 \times 2 &= 8 \\90 \div 9 + 12 \div 11 \times 8 - 1 &= 15 \\7 \times 8 - 7 \div 7 + 5 \div 6 &= 2 \\24 \div 12 + 8 \times 3 \div 6 \times 2 &= 10 \\9 \times 7 + 8 + 10 \div 9 - 3 &= 6 \\3 \times 3 + 2 \times 6 - 2 \div 8 &= 8 \\11 + 10 \div 3 + 4 \times 9 + 1 &= 100 \\35 \div 5 - 1 \times 8 \div 12 + 13 &= 17 \\40 \div 8 \times 2 + 6 \div 4 + 3 &= 7 \\5 + 4 \div 3 \times 12 - 4 \div 8 &= 4 \\8 \times 7 + 9 - 1 \div 8 \times 2 &= 16 \\44 + 10 \div 6 \times 3 + 3 \div 10 &= 3 \\12 \div 4 \times 11 + 7 \div 5 + 9 &= 17 \\6 \times 5 - 9 \div 3 \times 9 + 5 &= 68 \\12 \div 6 \times 7 - 8 \times 8 + 3 &= 51 \\18 + 2 \div 4 \times 5 + 8 - 4 &= 29\end{aligned}$$

8-number strands

$$\begin{aligned}2 \times 9 + 8 + 1 \div 3 \times 4 + 2 - 9 &= 29 \\16 + 8 - 10 \div 7 + 5 \times 8 + 4 \div 6 &= 10 \\5 \times 7 + 9 \div 11 + 8 \div 3 \times 7 - 2 &= 26 \\42 \div 7 \times 8 \div 4 + 9 \div 7 \div 3 \times 2 &= 2 \\45 \div 5 \div 3 \times 4 \div 2 \times 9 + 8 - 1 &= 61 \\28 \div 4 \times 0 + 8 \div 4 \times 11 + 3 \div 5 &= 5 \\6 \div 3 \times 9 + 10 - 10 \div 6 + 8 \times 5 &= 55 \\8 \times 6 + 9 - 1 \div 7 \times 4 + 3 \div 5 &= 7 \\26 + 2 \div 7 - 4 \times 7 + 9 \div 3 + 18 &= 21 \\17 - 9 \div 8 \times 5 + 4 \times 2 \div 6 + 31 &= 34 \\9 + 5 - 2 \times 7 - 3 \div 9 + 6 \div 5 &= 3 \\8 \times 9 - 4 - 2 \div 6 + 3 \div 7 \times 12 &= 24 \\37 + 7 \div 11 \times 10 - 4 \div 9 + 8 - 5 &= 7 \\2 \times 6 \times 5 \div 6 \div 2 \times 10 + 4 \div 9 &= 6 \\63 \div 7 \times 8 - 42 \div 5 + 3 \times 8 - 4 &= 68 \\29 + 7 \div 6 \div 2 \times 4 \div 1 + 0 \times 5 &= 60 \\31 + 2 \div 11 + 4 \times 8 - 7 \div 7 \times 9 &= 63 \\4 \times 2 + 4 \div 6 \times 9 + 6 \div 8 \times 9 &= 27 \\48 \div 8 \times 9 + 3 + 7 \div 8 \times 6 \div 12 &= 4 \\100 \div 10 \times 10 - 10 \div 10 \times 7 - 3 \div 10 &= 6\end{aligned}$$

8-number strands

$$\begin{aligned}3 \times 6 - 7 + 5 \div 4 \times 7 - 3 \div 5 &= 5 \\9 + 9 \div 3 + 6 \div 4 \times 9 + 5 \div 8 &= 4 \\7 \times 7 - 4 \div 5 - 3 \div 2 \times 12 + 5 &= 41 \\45 + 10 \div 11 \times 8 + 4 \div 11 + 6 \times 9 &= 90 \\10 + 9 - 4 \div 3 + 6 \times 7 - 5 \div 8 &= 9 \\11 - 8 + 9 \times 2 + 8 \div 4 \div 2 + 0 &= 4 \\24 \div 4 + 7 + 5 \div 3 \times 8 \div 6 + 9 &= 17 \\20 + 7 \div 9 \times 4 - 6 + 5 \times 10 - 11 &= 99 \\6 - 4 \times 8 + 9 \div 5 \times 1 + 4 \div 3 &= 3 \\1 \times 9 \div 3 \times 11 + 3 \div 9 + 7 - 9 &= 2 \\6 \times 10 \div 12 \times 3 - 10 \times 10 - 8 \div 7 &= 6 \\3 \times 7 + 8 + 1 \div 3 \times 10 - 12 \div 11 &= 8 \\9 + 7 \div 2 \times 3 + 8 \div 4 + 3 \times 2 &= 22 \\4 \times 6 - 3 \div 7 - 2 \times 9 \times 7 - 8 &= 55 \\54 \div 6 \times 4 \div 9 + 9 - 1 \times 7 + 7 &= 91 \\42 - 5 + 3 \div 8 + 7 \div 3 \times 8 - 5 &= 27 \\18 \div 2 \times 9 - 11 \div 7 \times 5 - 7 + 9 &= 52 \\7 \times 4 + 2 - 9 \div 3 + 8 \div 5 \times 12 &= 36 \\4 \times 1 + 7 \times 5 - 6 \div 7 \times 9 + 9 &= 72 \\9 \times 11 - 9 \div 9 + 11 \div 3 + 9 \div 4 &= 4\end{aligned}$$

Mental Math with Fractions

Add & Subtract Fractions

$$\frac{1}{4} + \frac{3}{4} + \frac{2}{4} - \frac{1}{4} + \frac{2}{4} - \frac{3}{4} = \frac{4}{4} \text{ or } 1$$

$$\frac{2}{2} + \frac{3}{2} - \frac{1}{2} + \frac{7}{2} - \frac{8}{2} + \frac{1}{2} = \frac{4}{2} \text{ or } 2$$

$$\frac{2}{3} + \frac{1}{3} + \frac{7}{3} - \frac{4}{3} + \frac{2}{3} - \frac{2}{3} = \frac{6}{3} \text{ or } 2$$

$$\frac{11}{5} + \frac{4}{5} - \frac{2}{5} + \frac{7}{5} - \frac{3}{5} + \frac{4}{5} = \frac{21}{5} \text{ or } 4\frac{1}{5}$$

$$\frac{1}{6} + \frac{5}{6} + \frac{3}{6} + \frac{8}{6} - \frac{10}{6} + \frac{2}{6} = \frac{9}{6} \text{ or } 1\frac{1}{2}$$

$$\frac{4}{7} - \frac{2}{7} + \frac{6}{7} - \frac{1}{7} + \frac{9}{7} - \frac{5}{7} = \frac{11}{7} \text{ or } 1\frac{4}{7}$$

$$\frac{3}{8} + \frac{2}{8} + \frac{5}{8} - \frac{4}{8} + \frac{7}{8} - \frac{1}{8} = \frac{12}{8} \text{ or } 1\frac{1}{2}$$

$$\frac{3}{9} + \frac{6}{9} - \frac{1}{9} + \frac{2}{9} - \frac{1}{9} - 1 = \frac{0}{9} \text{ or } 0$$

$$\frac{4}{5} + \frac{2}{5} - \frac{1}{5} + \frac{3}{5} + \frac{1}{5} - 1 = \frac{4}{5}$$

$$\frac{3}{12} + \frac{8}{12} + \frac{4}{12} + \frac{2}{12} + \frac{1}{12} - 1 = \frac{6}{12} \text{ or } \frac{1}{2}$$

$$\frac{1}{3} + \frac{5}{3} + \frac{2}{3} + \frac{5}{3} - \frac{1}{3} - 1 = \frac{9}{3} \text{ or } 3$$

$$\frac{5}{4} + \frac{3}{4} - \frac{2}{4} + \frac{4}{4} + \frac{1}{4} - 1 = \frac{7}{4} \text{ or } 1\frac{3}{4}$$

$$\frac{2}{6} + \frac{3}{6} - \frac{1}{6} + \frac{3}{6} + \frac{2}{6} - 1 = \frac{3}{6} \text{ or } \frac{1}{2}$$

$$\frac{1}{8} + \frac{6}{8} - \frac{2}{8} + \frac{4}{8} - \frac{1}{8} - \frac{1}{2} = \frac{4}{8} \text{ or } \frac{1}{2}$$

$$\frac{4}{10} - \frac{2}{10} - \frac{1}{10} + \frac{3}{10} + \frac{1}{10} - \frac{1}{2} = \frac{0}{10} \text{ or } 0$$

$$\frac{1}{12} + \frac{9}{12} - \frac{2}{12} + \frac{4}{12} - \frac{2}{12} - \frac{1}{2} = \frac{4}{12} \text{ or } \frac{1}{3}$$

$$1 - \frac{2}{3} + \frac{5}{3} + \frac{1}{3} - \frac{3}{3} + \frac{1}{3} = \frac{5}{3} \text{ or } 1\frac{2}{3}$$

$$\frac{1}{2} + \frac{5}{2} - \frac{4}{2} + \frac{7}{2} - \frac{1}{2} - 1 = \frac{6}{2} \text{ or } 3$$

$$1 - \frac{2}{5} + \frac{3}{5} + \frac{1}{5} + \frac{4}{5} - \frac{1}{5} = \frac{10}{5} \text{ or } 2$$

$$\frac{1}{4} + \frac{6}{4} + \frac{2}{4} - \frac{1}{4} + \frac{2}{4} - \frac{1}{2} = \frac{8}{4} \text{ or } 2$$

$$\frac{7}{9} + \frac{3}{9} - \frac{1}{9} - \frac{2}{9} + \frac{11}{9} - 1 = \frac{9}{9} \text{ or } 1$$

Multiply & Divide Fractions

$$2 \times \frac{2}{4} + \frac{1}{4} - \frac{3}{4} + \frac{3}{4} - \frac{1}{4} = \frac{4}{4} \text{ or } 1$$

$$\frac{1}{2} \times 2 + \frac{1}{2} \times 2 - \frac{1}{2} \times 1 = \frac{5}{2} \text{ or } 2\frac{1}{2}$$

$$\frac{1}{3} + \frac{2}{3} + \frac{2}{3} + \frac{1}{3} - \frac{2}{3} \div 2 = \frac{2}{3}$$

$$\frac{3}{9} - \frac{2}{9} + \frac{5}{9} + \frac{4}{9} - \frac{1}{9} \div 3 = \frac{3}{9} \text{ or } \frac{1}{3}$$

$$\frac{8}{2} \div 2 - \frac{2}{2} + \frac{3}{2} \times 2 \div 5 = \frac{2}{2} \text{ or } 1$$

$$\frac{2}{3} \times 3 \div 2 + \frac{9}{3} + \frac{2}{3} - \frac{1}{3} = \frac{13}{3} \text{ or } 4\frac{1}{3}$$

$$3 \times \frac{4}{5} - \frac{2}{5} \div 5 + \frac{1}{5} + 1 = \frac{8}{5} \text{ or } 1\frac{3}{5}$$

$$2 \times \frac{3}{4} + \frac{2}{4} - \frac{1}{4} + \frac{1}{4} \div 4 = \frac{2}{4} \text{ or } \frac{1}{2}$$

$$4 \times \frac{2}{3} \div 2 \times 7 \div 4 + \frac{1}{3} = \frac{8}{3} \text{ or } 2\frac{2}{3}$$

$$7 \times \frac{1}{7} + \frac{2}{7} \div 3 \times 2 - \frac{1}{7} = \frac{5}{7}$$

$$\frac{5}{6} \times 2 - \frac{1}{6} \div 3 + \frac{5}{6} \div 2 = \frac{4}{6} \text{ or } \frac{2}{3}$$

$$\frac{6}{8} \div 3 \times 1 + \frac{1}{8} \times 6 + \frac{6}{8} = \frac{24}{8} \text{ or } 3$$

$$\frac{3}{4} \times 6 \div 6 + \frac{2}{4} - \frac{1}{4} \times 2 = \frac{8}{4} \text{ or } 2$$

$$\frac{2}{10} \div 2 \times 9 + \frac{3}{10} - 1 \times 2 = \frac{4}{10} \text{ or } \frac{2}{5}$$

$$5 \times \frac{1}{9} \times 2 \div 5 + \frac{7}{9} \times 2 = \frac{18}{9} \text{ or } 2$$

$$\frac{5}{3} \div \frac{1}{3} \times \frac{1}{2} + \frac{3}{2} \div 2 \div 2 = \frac{2}{2} \text{ or } 1$$

$$\frac{2}{5} \times 6 \div 3 \times 2 \div \frac{2}{5} \times \frac{1}{9} = \frac{4}{9}$$

$$3 \times \frac{5}{8} \div 5 \div \frac{1}{8} \times \frac{2}{3} \div 2 = \frac{3}{3} \text{ or } 1$$

$$8 \times \frac{1}{2} \div 4 \times \frac{1}{3} \times 6 \div 3 = \frac{4}{6} \text{ or } \frac{2}{3}$$

$$10 \times \frac{2}{5} \times \frac{2}{3} \div 4 \times 3 \div 2 = \frac{3}{3} \text{ or } 1$$

$$\frac{5}{6} \times 6 \div 5 \times 1 \times 7 + \frac{3}{6} = \frac{45}{6} \text{ or } 7\frac{1}{2}$$