

# Study Link 3.1

① Illinois

② 851,000, 4,822,000, 8,712,000  
12,051,000

③ 3,971,000

④ 3,890,000

⑤ 3,339,000

⑥ Increases by 4,000,000 every  
50 years

⑦ 
$$\begin{array}{r} 12,051,000 \\ + 4,000,000 \\ \hline 16,051,000 \end{array}$$

⑧ 
$$\begin{array}{r} 12,051,000 \\ + 2,000,000 \\ \hline 14,051,000 \end{array}$$

## Practice

⑨ 
$$\begin{array}{r} 69,452 \\ + 15,679 \\ \hline 85,131 \end{array}$$

⑩ 
$$\begin{array}{r} 618 \\ - 139 \\ \hline 39 \end{array}$$

⑪ 
$$\begin{array}{r} 43 \\ 14 \\ \hline 172 \\ + 430 \\ \hline 602 \end{array}$$

or 
$$\begin{array}{|c|c|c|} \hline 4 & 3 & 1 \\ \hline 6 & 16 & 2 \\ \hline 0 & 2 & 4 \end{array}$$

⑫ 
$$\begin{array}{r} 8R2 \\ 7 \overline{)58} \\ - 56 \\ \hline 2 \end{array}$$
 or  $8\frac{2}{7}$

# Study Link 3.2

- ① A      ② 5,472,000      ③ H  
 ④ a About 250,000,000

$$\frac{7}{10} \times B = 175,104,000$$

$$7B = 1,751,040,000$$

$$B = 7 \overline{) 250,148,571 \frac{3}{7}}$$

-14	↓	↓	↓	↓	↓	↓
35	↓	↓	↓	↓	↓	↓
35	↓	↓	↓	↓	↓	↓
-01	↓	↓	↓	↓	↓	↓
-10	↓	↓	↓	↓	↓	↓
-7	↓	↓	↓	↓	↓	↓
284	↓	↓	↓	↓	↓	↓
-28	↓	↓	↓	↓	↓	↓
560	↓	↓	↓	↓	↓	↓
-56	↓	↓	↓	↓	↓	↓
340	↓	↓	↓	↓	↓	↓
-35	↓	↓	↓	↓	↓	↓
480	↓	↓	↓	↓	↓	↓
-49	↓	↓	↓	↓	↓	↓
10	↓	↓	↓	↓	↓	↓
-7	↓	↓	↓	↓	↓	↓
3	↓	↓	↓	↓	↓	↓

$$\textcircled{4}^b \frac{136,800,000}{250,000,000} =$$

$$0.5472$$

||

$$55\%$$

Use a calculator to divide

# Practice

$$\begin{array}{r} \textcircled{5} \quad 2860 \\ - 148 \\ \hline 108 \end{array}$$

$$\begin{array}{r} \textcircled{6} \quad 26,551 \\ + 2,558 \\ \hline 29,109 \end{array}$$

$$\begin{array}{r} \textcircled{7} \quad 36 \\ \quad 27 \\ \hline 252 \\ 720 \\ \hline 972 \end{array}$$

or

0	6	1	2	2	
9	2	1	4	2	7
	7	2			

$$\begin{array}{r} \textcircled{8} \quad 18 \\ 3 \overline{) 54} \\ - 3 \downarrow \\ \hline 24 \\ - 24 \\ \hline 0 \end{array}$$

$$\begin{array}{r} \textcircled{9} \quad 9 \overline{) 74} \text{ R}2 \\ - 72 \\ \hline 2 \end{array} \quad \text{or} \quad 9 \frac{2}{8} = \frac{1}{4}$$

**STUDY LINK**  
**3•3**

# Finding Angle Measures



Figure out the angle measures for the labeled angles in the patterns below. Remember that there are  $360^\circ$  in a circle and  $180^\circ$  in a straight line. Use the Geometry Template, or cut out the shapes at the bottom of this page to help you. Do not use a protractor.

1. *180° is a straight line*  
*3 F is a 1/3*

$m\angle D = 180 \div 3 = 60^\circ$   
 $m\angle E = 180 \div 2 = 90^\circ$   
 $m\angle F = 180 \div 3 = 60^\circ$

2. *360° ÷ 6 = 60°*  
*60° + 60° = 120°*

*Equalateral triangle, All sides & angles equal*

$m\angle A = 120^\circ$   
 $m\angle B = 180^\circ \div 3 = 60^\circ$   
 $m\angle C = 180^\circ \div 3 = 60^\circ$

3. *180° is a straight line*  
*2 D is a 1/3*

*360° ÷ 8 = 45°*  
*180 - 45 = 135°*

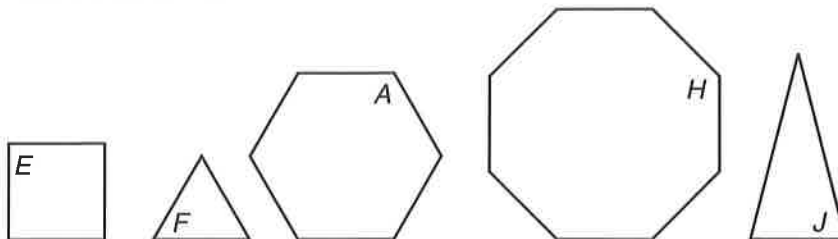
4. *180°*

$m\angle J = 180^\circ \div 6 = 30^\circ$   
 $m\angle K = 75^\circ$

$m\angle G = 90^\circ$  *Corner of a square*  
 $m\angle H = 135^\circ$   
 $m\angle I = 135^\circ$

$m\angle J = 180^\circ \div 6 = 30^\circ$   
 $m\angle K = 75^\circ$   
*There are 180° in a triangle.  $180^\circ - 30^\circ = 150^\circ$   
 $150^\circ \div 2 = 75^\circ$*

5. On the back of this page, explain how you found the measure of  $\angle I$ .



# Study Link 3.4

①  $70^\circ$

②  $50^\circ$

③  $110^\circ$

④  $130^\circ$

⑤  $160^\circ$      $130^\circ - 70^\circ =$

⑥  $180^\circ$

⑦  $120^\circ$

⑧  $90^\circ$      $210^\circ - 120^\circ$

⑨  $50^\circ$      $360^\circ - 310^\circ =$

⑩  $150^\circ$      $360^\circ - 210^\circ =$

Always measure the inside of the angle, unless told otherwise.

⑪  $170^\circ$      $120^\circ + 50^\circ =$

## Practice

⑫ 
$$\begin{array}{r} 5,844 \\ + 2,399 \\ \hline 8,243 \end{array}$$

⑬ 
$$\begin{array}{r} 288 \\ - 129 \\ \hline 109 \end{array}$$

⑮ 
$$\begin{array}{r} 12 \\ 5 \overline{) 60} \\ \underline{-50} \phantom{0} \\ 10 \\ \underline{-10} \\ 0 \end{array}$$

⑭ 
$$\begin{array}{r} 234 \\ \phantom{0}22 \\ \hline 1468 \\ 4680 \\ \hline 5,148 \end{array}$$

or

$$\begin{array}{r} 234 \\ \hline \begin{array}{|c|c|c|c|} \hline 0 & 4 & 6 & 8 \\ \hline 4 & 6 & 8 & 2 \\ \hline 4 & 6 & 8 & 2 \\ \hline \end{array} \\ \hline 148 \end{array}$$

⑯ 
$$\begin{array}{r} 8 \\ 6 \overline{) 50} R2 \\ \underline{-48} \\ 2 \end{array}$$
 or  $8\frac{2}{6} = \frac{1}{3}$



# Study 3.5

- ① Acute  $12^\circ$
- ② Acute  $65^\circ$
- ③ Obtuse  $103^\circ$
- ④ Adjacent Angles are next to each other  
 $\angle D \text{ \& } \angle E$ ,  $\angle E \text{ \& } \angle F$ ,  $\angle G \text{ \& } \angle I$ ,  $\angle I \text{ \& } \angle H$
- ⑤ Vertical Angles are across from each other  
 $\angle D \text{ \& } \angle F$ ,  $\angle G \text{ \& } \angle H$
- ⑥ Opposite Angles are also known as vertical angles  
 $\angle D \text{ \& } \angle F$ ,  $\angle G \text{ \& } \angle H$

## Practice

⑦ 
$$\begin{array}{r} 7,568 \\ + 9,217 \\ \hline 16,785 \end{array}$$

⑧ 
$$\begin{array}{r} 415 \\ - 207 \\ \hline 208 \end{array}$$

⑨ 
$$\begin{array}{r} 326 \\ \times 45 \\ \hline 1630 \\ 13040 \\ \hline 14670 \end{array}$$

or 
$$\begin{array}{r} 326 \\ 4 \overline{) 13044} \\ \underline{415} \phantom{0} \\ 670 \phantom{0} \end{array}$$

⑩ 
$$\begin{array}{r} 17 \\ 4 \overline{) 68} \\ \underline{-41} \phantom{0} \\ 28 \\ \underline{-28} \\ 0 \end{array}$$

⑪ 
$$\begin{array}{r} 11R1 \\ 7 \overline{) 78} \\ \underline{-76} \phantom{0} \\ 08 \\ \underline{-7} \phantom{0} \\ 1 \end{array}$$
 or  $11\frac{1}{7}$

## Study Link 3.6

- ① scalene - no sides are equal
- ② isosceles - 2 sides are equal
- ③ isosceles & right - The square means it is a right angle and 2 sides are equal.
- ④ equilateral & isosceles - All lengths are equal & at least two sides are equal
- ⑤ Answers vary based on objects chosen

### Practice

$$\begin{array}{r} \textcircled{6} \quad 4,117 \\ \quad 3,682 \\ + \quad 3,962 \\ \hline 11,761 \end{array}$$

$$\begin{array}{r} \textcircled{7} \quad \begin{array}{r} 79 \\ 8,036 \\ - 2,286 \\ \hline 5,750 \end{array} \end{array}$$

$$\begin{array}{r} \textcircled{8} \quad \begin{array}{r} 2 \quad 4 \\ 8481 \\ \times \quad 5 \\ \hline 42405 \end{array} \quad \text{or} \quad \begin{array}{r} 8481 \\ 4 \overline{) 42405} \\ \underline{4} \phantom{00} \\ 0 \phantom{00} \\ \underline{2} \phantom{00} \\ 4 \phantom{00} \\ \underline{4} \phantom{00} \\ 0 \phantom{00} \\ \underline{0} \phantom{00} \\ 5 \phantom{00} \\ \underline{5} \\ 0 \end{array} \end{array}$$

$$\begin{array}{r} \textcircled{9} \quad \begin{array}{r} 11 \\ 9 \overline{) 99} \\ \underline{-9} \phantom{0} \\ 09 \\ \underline{-9} \\ 0 \end{array} \end{array}$$

## Study Link 3.8

- ①-③ - Answers will vary  
based on examples found  
[www.tessellations.org](http://www.tessellations.org) has  
examples & additional help

### Practice

$$\begin{array}{r} \textcircled{4} \quad 1,987 \\ \quad 6,213 \\ + 2,046 \\ \hline 10,240 \end{array}$$

$$\begin{array}{r} \textcircled{5} \quad \overset{510}{4675} \\ \quad - 3148 \\ \hline 1,467 \end{array}$$

$$\begin{array}{r} \textcircled{6} \quad \overset{513}{3714} \\ \times \quad \quad 8 \\ \hline 29,712 \end{array}$$

or

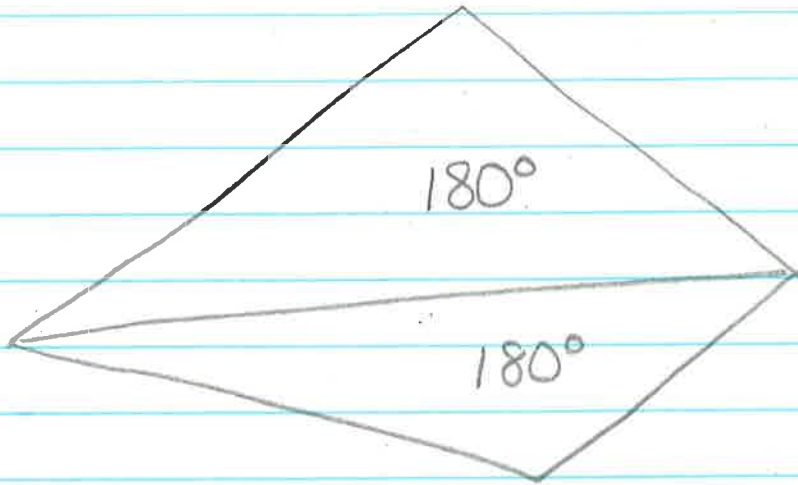
$$2 \overline{) \begin{array}{|c|c|c|c|} \hline 2 & 4 & 5 & 6 \\ \hline 4 & 6 & 8 & 2 \\ \hline \end{array} } 8$$

$$\begin{array}{r} \textcircled{7} \quad \quad 5R4 \\ \overline{) 7139} \\ \underline{-35} \\ \quad 4 \end{array} \quad \text{or} \quad 5\overline{) 4}$$



# Study link 3.9

①



②  $360^\circ$

Practice

$$\begin{array}{r} \textcircled{4} \quad 3,007 \\ \quad 1,251 \\ + \quad 980 \\ \hline 5,238 \end{array}$$

$$\begin{array}{r} \textcircled{5} \quad 4,810 \\ \quad -1,290 \\ \hline 3,020 \end{array}$$


$$\begin{array}{r} \textcircled{6} \quad 451 \\ \quad 3692 \\ \times \quad \quad 6 \\ \hline 22,152 \end{array}$$

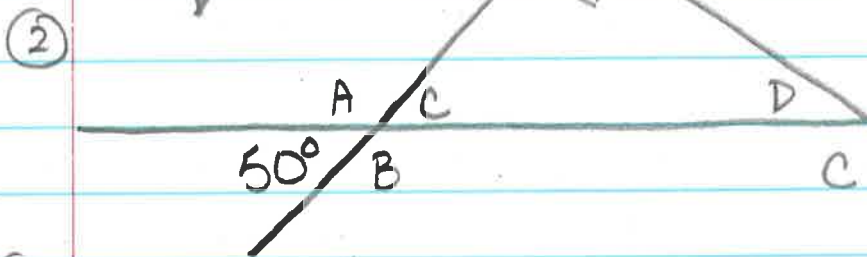
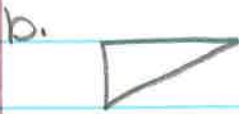
or

$$\begin{array}{r} 3692 \\ 2 \overline{) 7384} \\ \underline{2} \quad 152 \\ \underline{2} \quad 152 \\ \underline{\quad} \quad 0 \end{array}$$

$$\begin{array}{r} \textcircled{7} \quad 8 \overline{) 67} R3 \\ \underline{-64} \\ 3 \end{array} \quad \text{or} \quad 8\frac{3}{8}$$

# Study Link 3.10

① a  Example: It must be a closed figure with corners



$c = 50^\circ$  Because it is opposite

③ a 2cm (measure w/ a ruler)

$$a = 180^\circ \text{ (straight line)} - 50^\circ = 130^\circ$$

b. Quadrangle =  $360^\circ$

$b = 130^\circ$  Opposite of a

-  $110^\circ$  ( $\angle D$ )

-  $90^\circ$  ( $\angle C$ )

-  $90^\circ$  ( $\angle B$ )

---

  $70^\circ$

$d = 40^\circ$  Because a triangle has  $180^\circ = 90^\circ - 130^\circ$

c.  $360^\circ$

d. trapezoid - Only 1 side of parallel sides

Practice,

$$\begin{array}{r} \textcircled{4} \quad 1,476 \\ \quad 2,724 \\ + 3,241 \\ \hline 7,441 \end{array}$$

$$\begin{array}{r} \textcircled{5} \quad \begin{array}{cc} 3 & 9 \\ 4, & \cancel{0}02 \end{array} \\ - 1,361 \\ \hline 2,641 \end{array}$$

$$\begin{array}{r} \textcircled{6} \quad 5031 \\ \times \quad \quad 4 \\ \hline 20124 \end{array}$$

or

2	0	0	1	0	4
2	0	1	2	4	

$$\begin{array}{r} \textcircled{7} \quad \quad 3 \\ 9 \overline{) 27} \\ - 27 \\ \hline 0 \end{array}$$