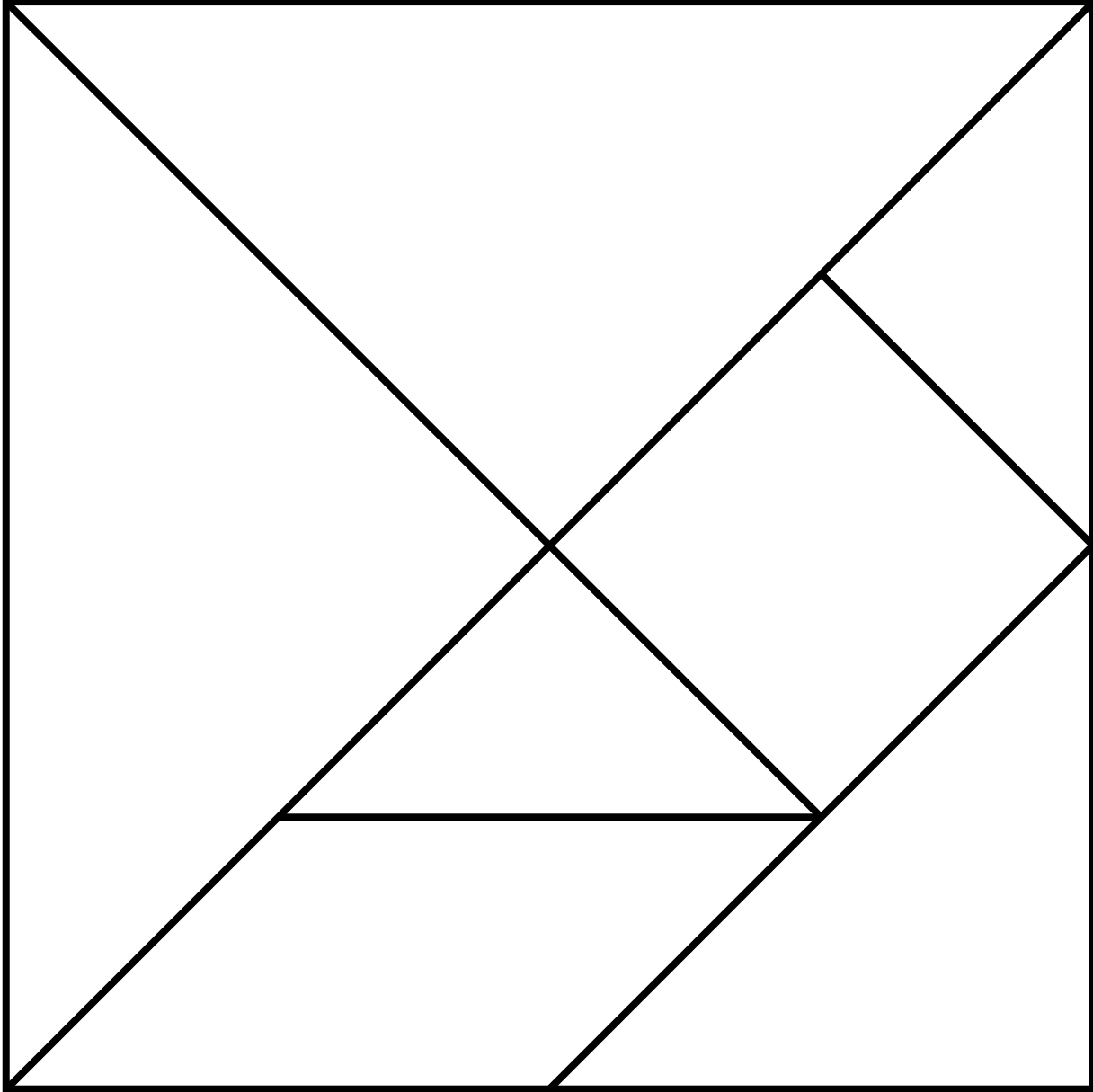


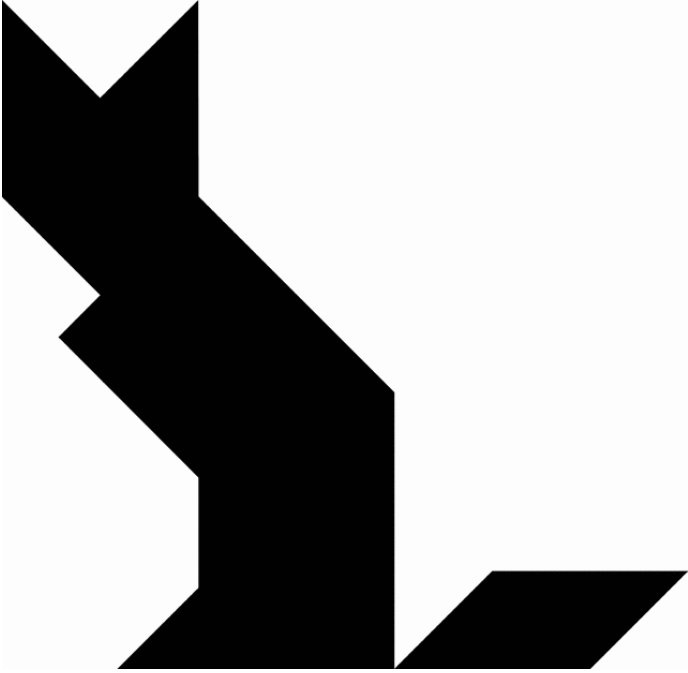
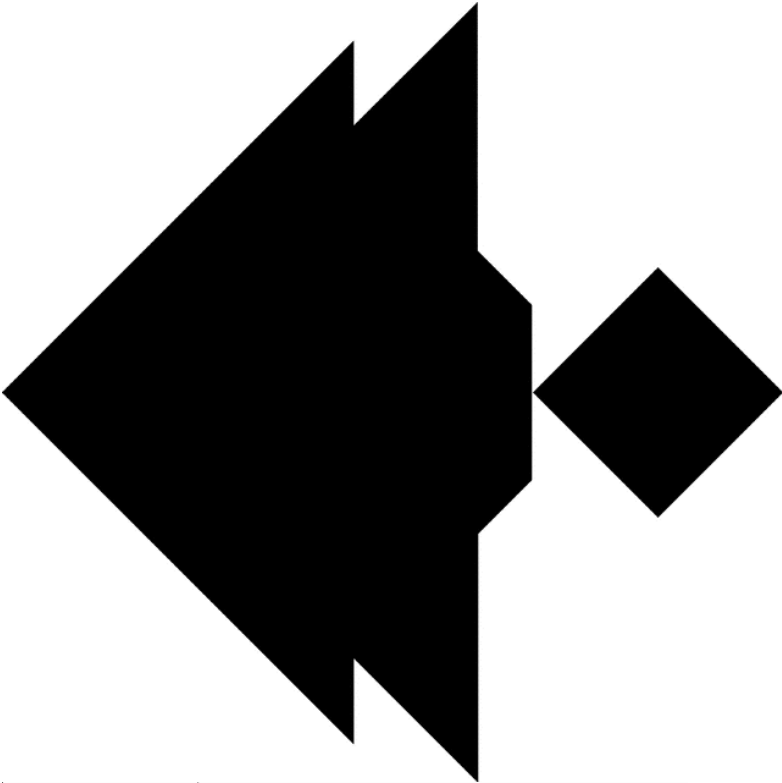
Focusing on Mathematical Reasoning: Activities for the Classroom

Bonnie Goonen
bv73008@aol.com

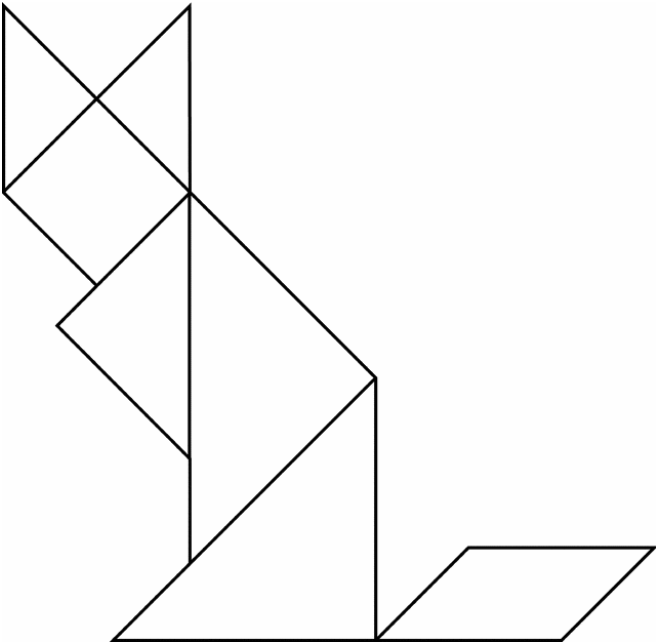
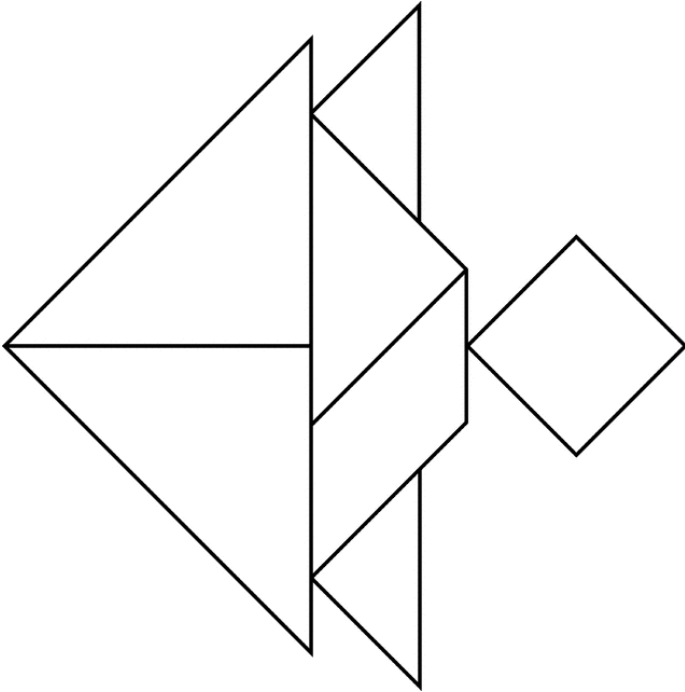
Tangrams Template



Tangram Activity



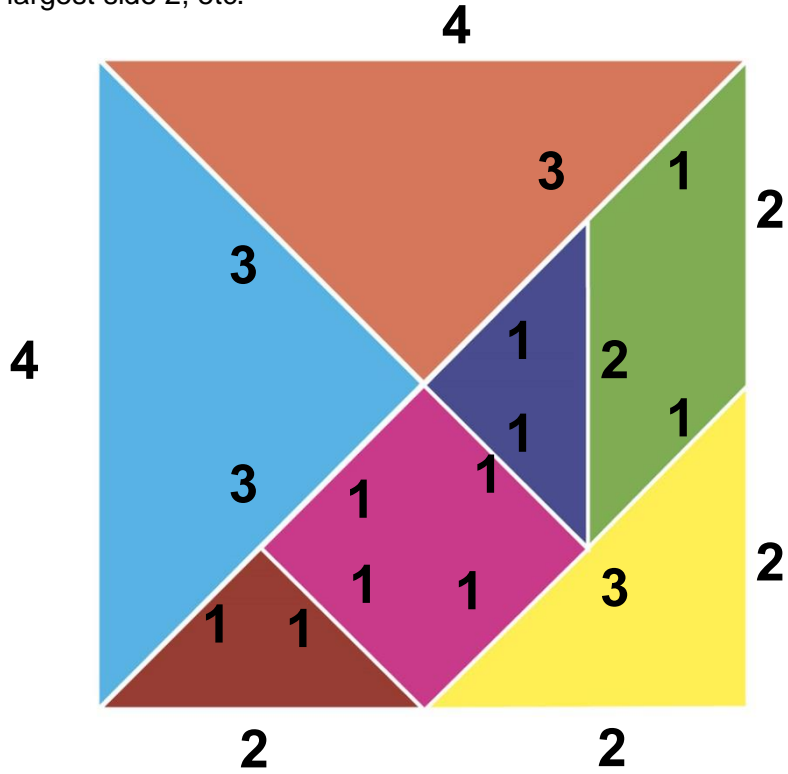
Tangram Answers



Answer to Activity 1

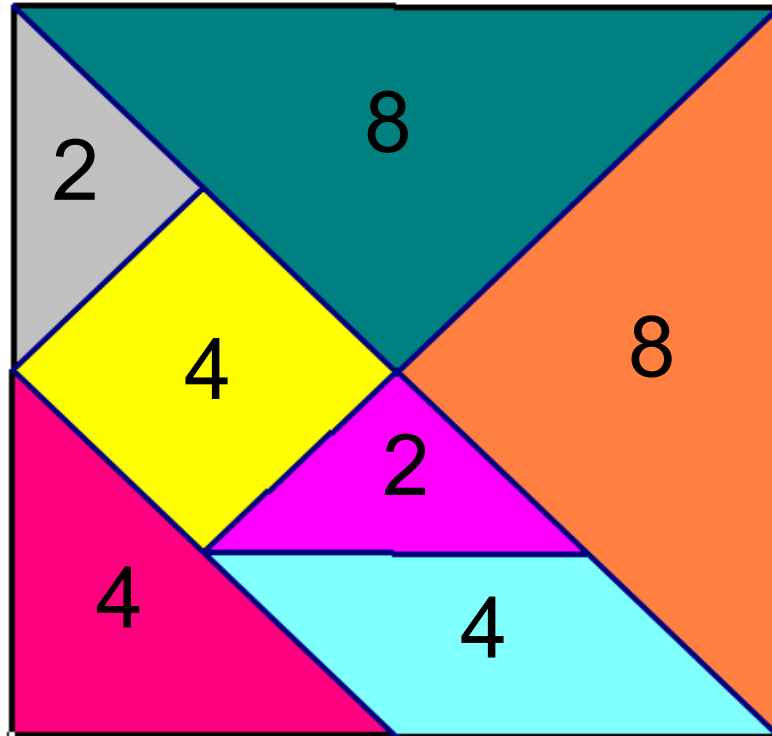
How many different lengths are involved? There are four different measurements.

Number the lengths in order from smallest to largest. Start by labeling the smallest side 1, the next largest side 2, etc.



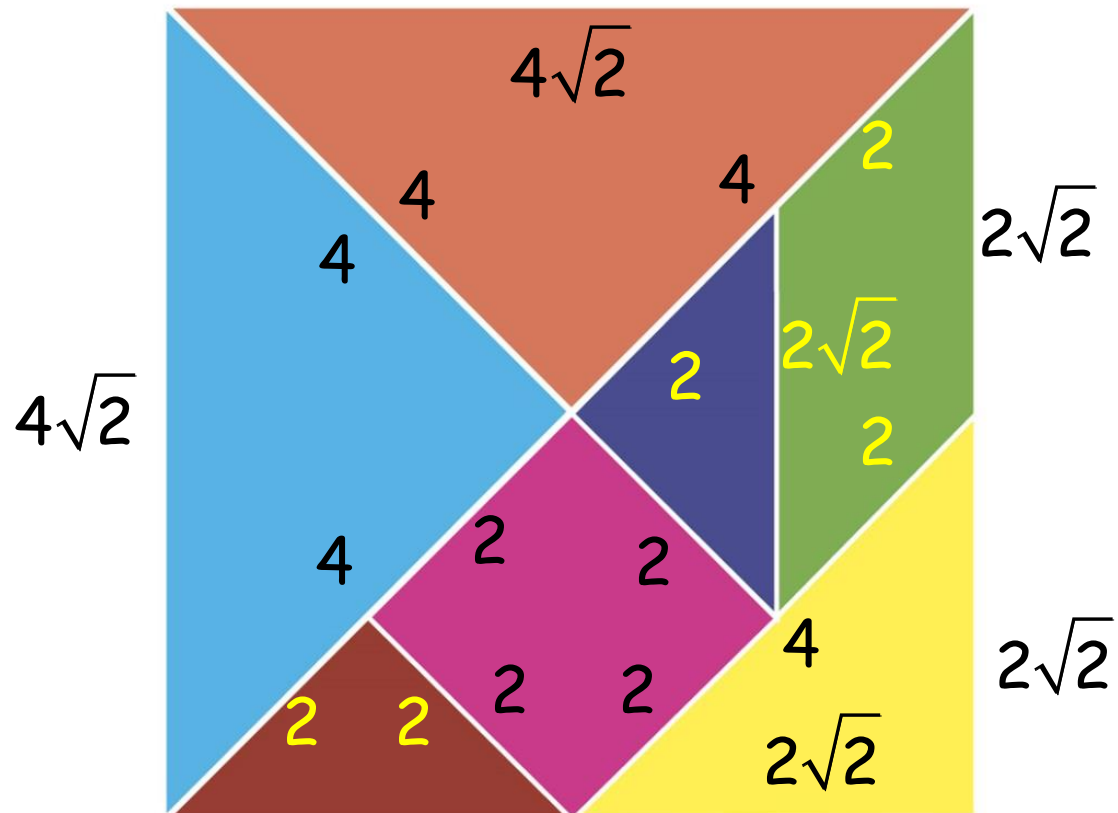
Answer to Activity 2

If the area of the parallelogram is equal to 4 square units find the area of each piece.


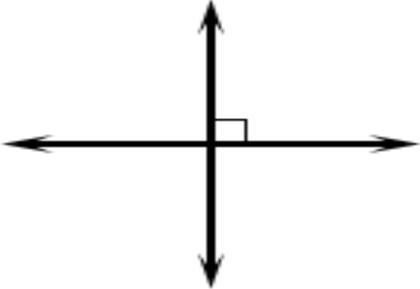
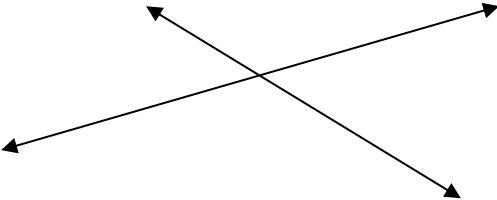


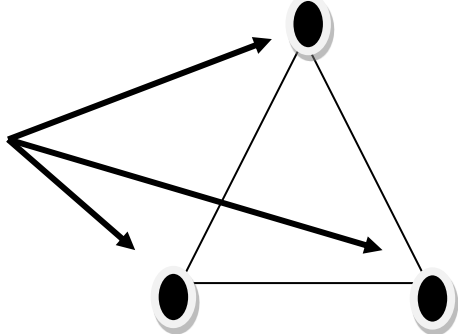
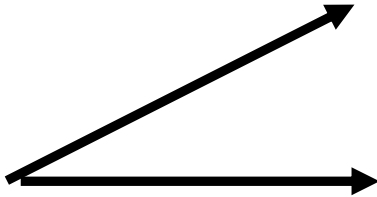
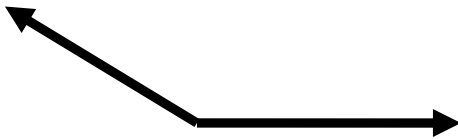
Answer to Activity 3



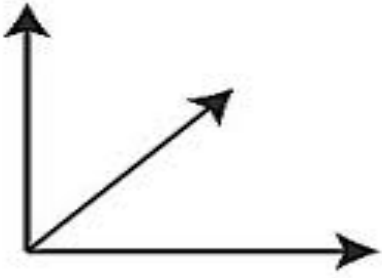
If the area of the small square is equal to 4, find the length of each side of each piece.

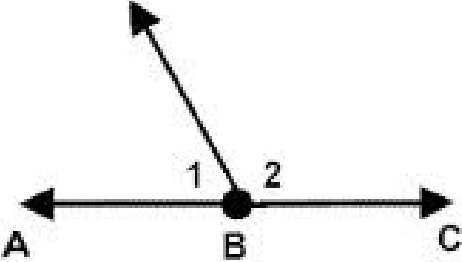
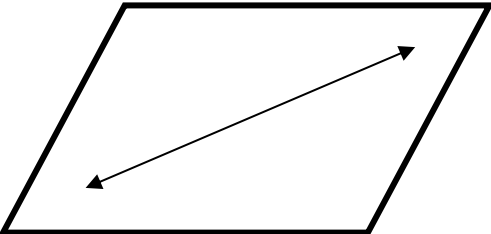
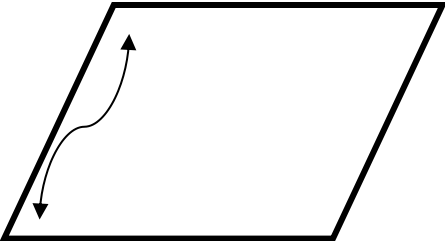


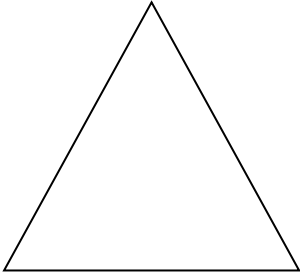
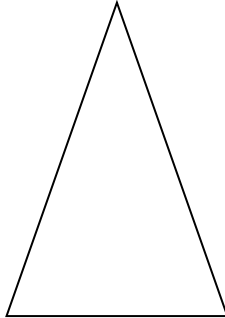
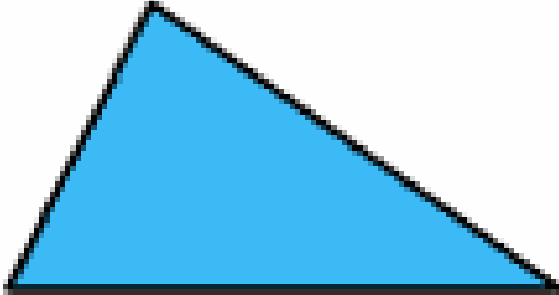
Geometry Match Game

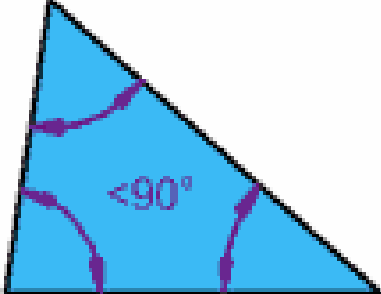
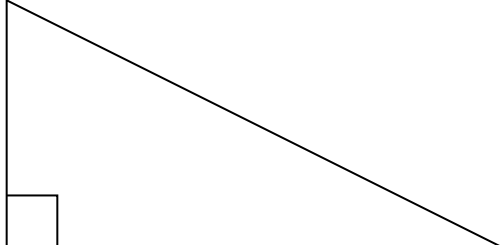
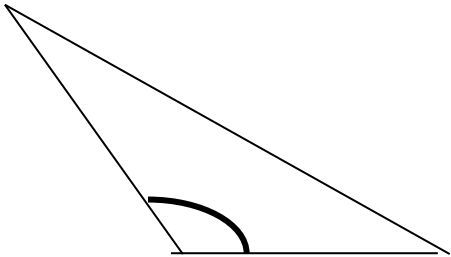
parallel lines		lines that stay same distance from each other forever and never intersect
perpendicular lines		lines that cross at a point and form 90° angles
intersecting lines		lines that cross at a point

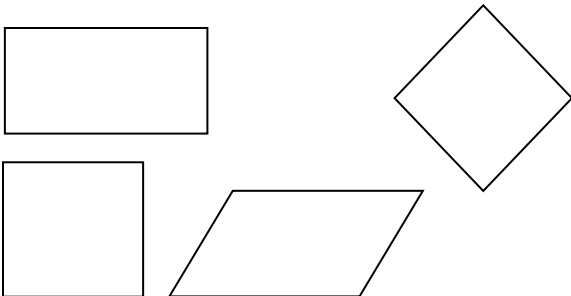

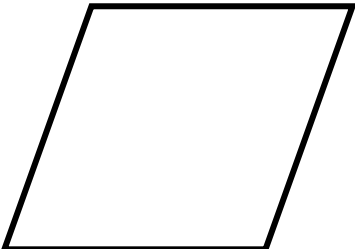
<p>vertices</p>		<p>a point where two or more lines come together; also called a corner on a polygon</p>
<p>acute angle</p>		<p>an angle that is less than 90°</p>
<p>obtuse angle</p>		<p>an angle that is more than 90° and less than 180°</p>




right angle		an angle that is exactly 90°
straight angle		an angle that is exactly 180°
complementary angles		two angles that add up to 90°

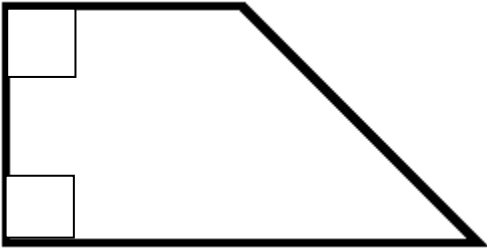
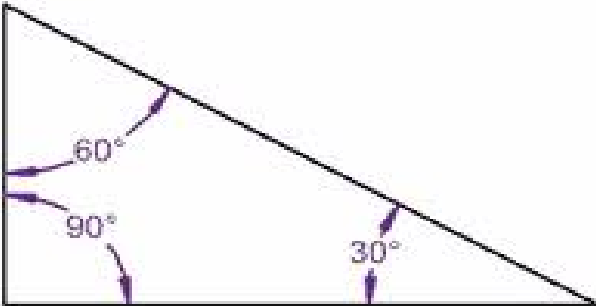
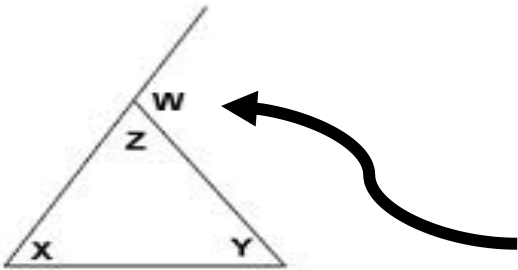
<p>supplementary angles</p>		<p>two angles that add up to 180°</p>
<p>opposite angles</p>		<p>angles that are across from each other; they do not share a side or vertex</p>
<p>adjacent angles</p>		<p>two angles that are formed with a common side</p>

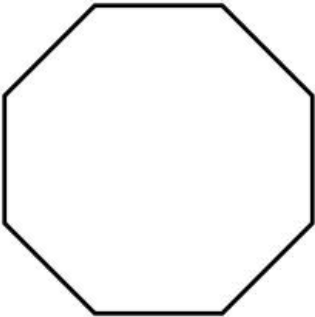
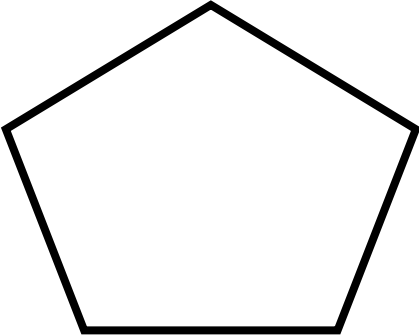
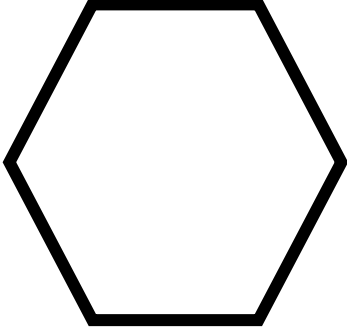
equilateral triangle		a triangle with three equal sides
isosceles triangle		a triangle with two equal sides
scalene triangle		a triangle with no equal sides

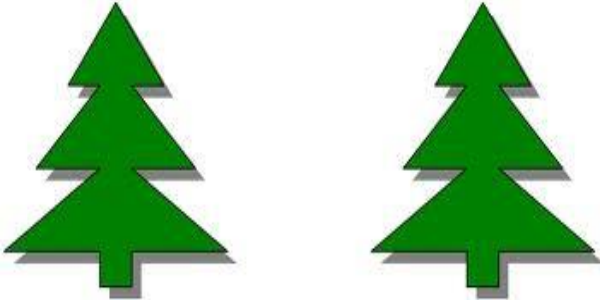
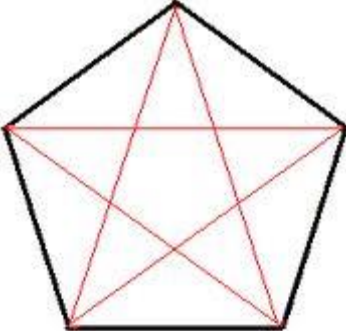
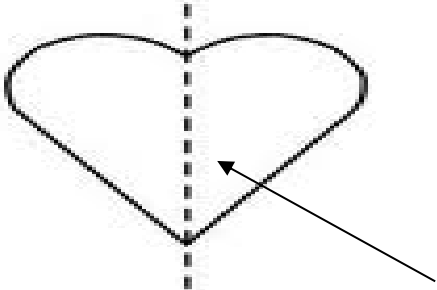
<p>acute triangle</p>		<p>A triangle with all acute angles</p>
<p>right triangle</p>		<p>A triangle with one right angle</p>
<p>obtuse triangle</p>		<p>A triangle with one obtuse angle</p>


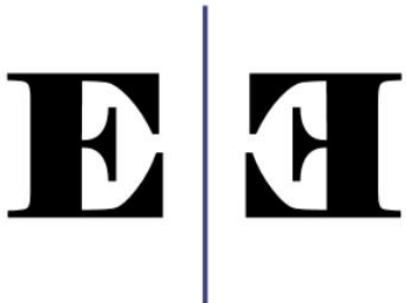
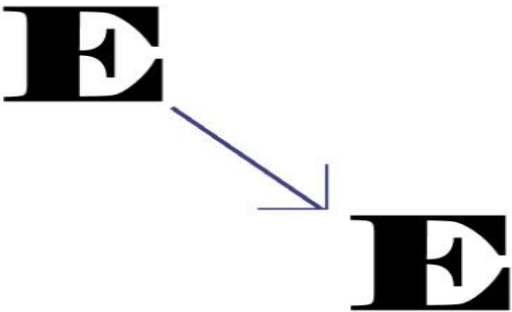
<p>quadrilateral</p>		<p>a four sided polygon; angles total 360°</p>
<p>parallelogram</p>		<p>contains two sets of parallel sides</p>
<p>rhombus</p>		<p>contains two sets of parallel sides that are all congruent</p>

rectangle		contains two sets of parallel sides that form four 90° angles
square		contains two sets of parallel sides that form four 90° angles; all sides are congruent
isosceles trapezoid		a quadrilateral that contains one set of parallel sides; also contains two opposite congruent sides

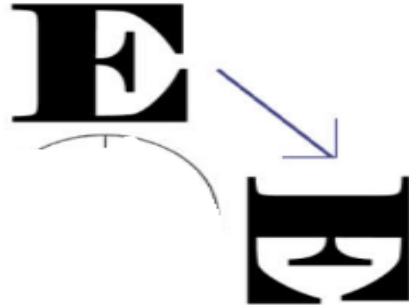
<p>right trapezoid</p>		<p>a quadrilateral that contains one set of parallel sides and contains two right angles</p>
<p>interior angles</p>		<p>the angles inside of a figure; in a triangle, these add up to 180°</p>
<p>exterior angles</p>		<p>the angles on the outside of a figure when the sides are extended</p>

octagon		an 8-sided polygon
pentagon		a 5-sided polygon
hexagon		a 6-sided polygon

<p>congruent</p>		<p>a word meaning equal or same; it is used to describe figures, sides, and angles</p>
<p>diagonal</p>		<p>a line that cuts across a figure connecting two vertices that are not adjacent</p>
<p>line symmetry</p>		<p>a figure has this when a line can divide it into two congruent parts</p>

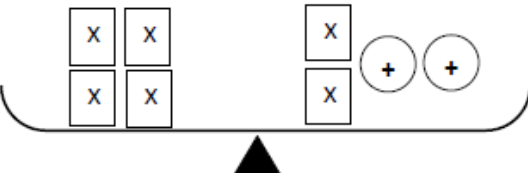
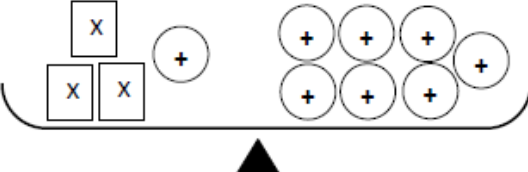
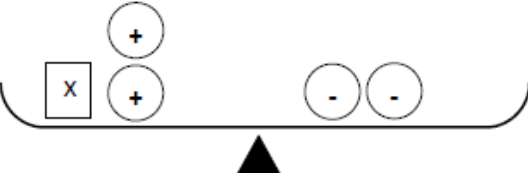
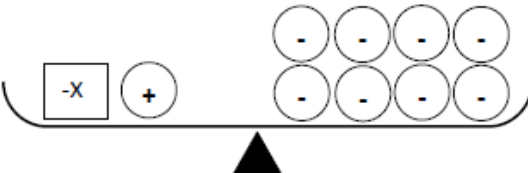
<p>rotational symmetry</p>		<p>a figure has this when can be turned around a point and look exactly the same as its original image after some rotating</p>
<p>reflection</p>		<p>a transformation that moves a figure by flipping it across a line</p>
<p>translation</p>		<p>a transformation that moves a figure in a straight line without turning or flipping</p>

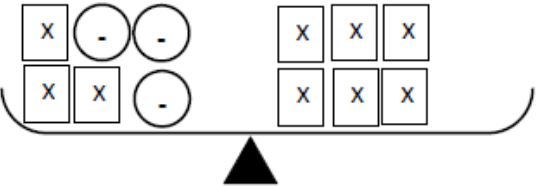
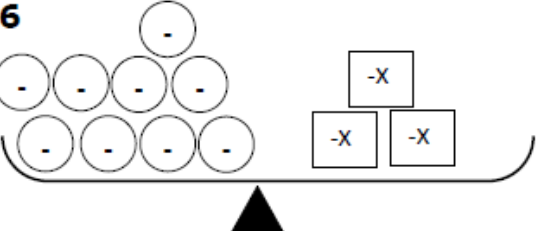
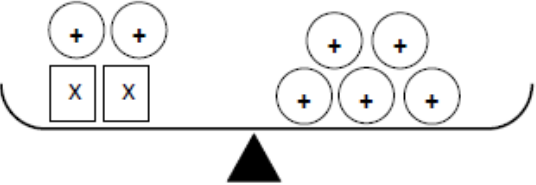
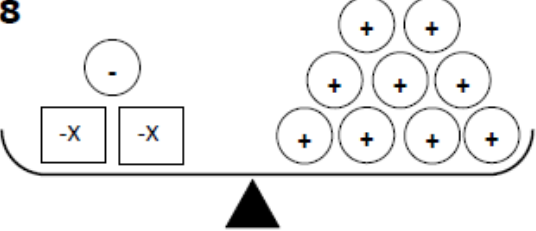
rotation

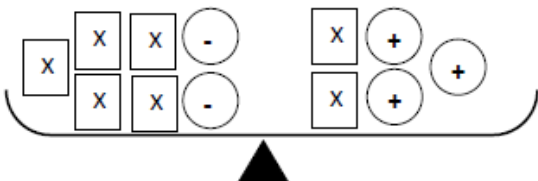
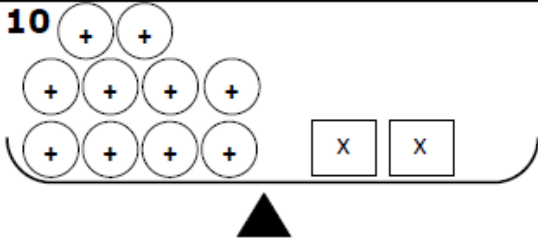
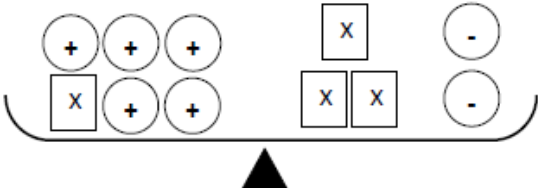
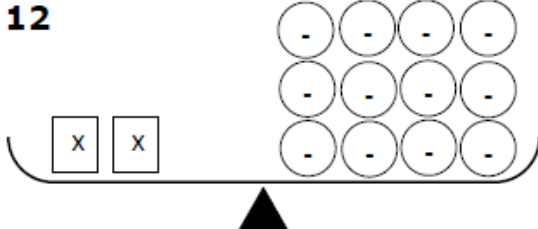


a transformation that
moves a figure by turning
it

Algebra Match Game – Model → Equation → Solution

<p>1</p> 	<p>H</p> $4x = 2x + 2$	<p>□</p> $x = 1$
<p>2</p> 	<p>P</p> $3x + 1 = 7$	<p>Ю</p> $x = 2$
<p>3</p> 	<p>M</p> $x + 2 = -2$	<p>‡</p> $x = -4$
<p>4</p> 	<p>C</p> $-x + 1 = -8$	<p>*</p> $x = 9$

<p>5</p> 	<p>G</p> $3x - 3 = 6x$	<p>!!</p> $x = -1$
<p>6</p> 	<p>D</p> $-9 = -3x$	<p>Δ</p> $x = 3$
<p>7</p> 	<p>L</p> $2x + 2 = 5$	<p>••</p> $x = 1.5$
<p>8</p> 	<p>I</p> $-2x - 1 = 9$	<p>#</p> $x = -5$

<p>9</p> 	<p>F</p> $5x - 2 = 2x + 3$	<p>*</p> $x = 1\frac{2}{3}$
<p>10</p> 	<p>o</p> $10 = 2x$	<p>↔</p> $x = 5$
<p>11</p> 	<p>K</p> $x + 5 = 3x - 2$	<p>[+]</p> $x = 3\frac{1}{2}$
<p>12</p> 	<p>N</p> $2x = -12$	<p>§</p> $x = -6$

<p>13</p>	<p>A</p> $-2x - 6 = 8x$	<p>«««</p> $x = -\frac{3}{5}$
<p>14</p>	<p>J</p> $8 = -4x - 4$	<p>%</p> $x = -3$
<p>15</p>	<p>B</p> $2x = 11$	<p>÷</p> $x = 5.5$
<p>16</p>	<p>E</p> $-x + 2 = -5$	<p>♪</p> $x = 7$

Language of Algebra Match

A number decreased by 8	$n - 8$
A number minus 8	8 less than a number
A number squared	n^2

The square of a number	$n \times n$
A number divided by 6	$n \div 6$
$\frac{n}{6}$	The quotient of a number and 6

The sum of 9 and a
number

$$9 + n$$

Nine increased by a
number

$$n + 9$$

Twice the sum of 15
and a number

$$2(15 + n)$$

$$(15 + n) \cdot 2$$

Two times the sum of
15 and a number

7 more than the
product of 6 and a
number

$$6n + 7$$

$$7 + 6n$$

The product of 6 and
a number increased by
7

30 increased by 3 times the square of a number	$30 + 3n^2$
$3n^2 + 30$	30 more than 3 times the square of a number
Five squared	5^2

$$5 \cdot 5$$

Five raised to the
second power

Four times a number

$$4n$$

The product of a
number and 4

$$4 \cdot n$$

3 less than 5 times a number	$5n - 3$
The product of 5 and a number less 3	3 less than the product of 5 and a number
One-half the square of b	$\frac{1}{2} b^2$

$$\frac{b^2}{2}$$

The quotient of b squared and 2

Six times n squared plus 3

$$6n^2 + 3$$

Three more than the product of six and the square of a number

$$3 + 6n^2$$

$$\frac{2}{3}n^2$$

Two-thirds the square
of a number

The quotient of twice a
number squared and 3

$$\frac{2n^2}{3}$$

The difference of a
number and 1

$$n - 1$$

One less than a number	A number minus 1
The product of a number cubed and the square of another number	n^3m^2
A number cubed times another number squared	$n \cdot n \cdot n \cdot m \cdot m$