

| What you need to know & be able to do | Things to remember   | Problem   | Problem  |
|---------------------------------------|--|---|--|
| Translations                          | <ul style="list-style-type: none"> <li>Find the new coordinates by adding/subtracting the given value.</li> <li>Find the pre-image by doing the OPPOSITE.</li> <li>A translation is a rigid motion which means the pre-image and image are congruent</li> </ul>                                | <p>1. Translate the following points by the rule: <math>(x,y) \rightarrow (x+1,y-4)</math></p> <p><math>D(-5, 2) \rightarrow D'(-4, -2)</math></p> <p><math>O(-4, 5) \rightarrow O'(-3, 1)</math></p> <p><math>G(-1, 1) \rightarrow G'(0, -3)</math></p> <p><math>S(-4, -2) \rightarrow S'(-3, -6)</math></p> | <p>2. Translation: <math>(x, y) \rightarrow (x-2, y-6)</math></p> <p>Graph pre-image and image.</p> <p><math>C(3, 2)</math> <math>A(2, 4)</math> <math>T(3, 5)</math> <math>S(5, 2)</math></p>   |
| Reflections                           | <ul style="list-style-type: none"> <li>Reflect over x-axis: <math>(x, -y)</math></li> <li>Reflect over y-axis: <math>(-x, y)</math></li> <li>Reflect across <math>y = x</math> (switch x and y)</li> <li>Reflect across <math>y = -x</math> (switch x and y AND change their signs)</li> </ul> | <p>3. Reflect across <math>y = x</math> <math>(x,y) \rightarrow (y,x)</math></p> <p><math>E(-1,5) \rightarrow E'(5,-1)</math> <math>G(-2,1) \rightarrow G'(1,-2)</math> <math>H(-2,-2) \rightarrow H'(-2,-2)</math> <math>I(4,0) \rightarrow I'(0,4)</math></p>   | <p>4. Reflect across <math>y = -x</math> then reflect across the y-axis <math>(x,y) \rightarrow (-y,x)</math></p> <p><math>W(-3,-1) \rightarrow W'(1,3)</math><br/> <math>B(-5,-2) \rightarrow B'(2,5)</math><br/> <math>F(-3,-3) \rightarrow F'(3,3)</math></p>       |
| Rotations                             | <ul style="list-style-type: none"> <li>90CW/270CCW: <math>(y, -x)</math></li> <li>180: <math>(-x, -y)</math></li> <li>90CCW/270CW: <math>(-y, x)</math></li> <li>"drive the car": the fist that goes over the other is the sign that changes; switch the order.</li> </ul>                     | <p>5. Rotate the figure 90 CW <math>(x,y) \rightarrow (y,-x)</math></p> <p><math>W(-2,1) \rightarrow W'(-1,2)</math><br/> <math>E(3,1) \rightarrow E'(1,-3)</math><br/> <math>T(0,5) \rightarrow T'(5,0)</math></p>   | <p>6. Rotate the figure 90 CCW <math>(x,y) \rightarrow (-y,x)</math></p> <p><math>D(-1,3) \rightarrow D'(-3,-1)</math><br/> <math>Y(-1,1) \rightarrow Y'(-1,1)</math><br/> <math>X(-1,-1) \rightarrow X'(1,-1)</math><br/> <math>L(3,4) \rightarrow L'(4,3)</math></p> |
| Dilations                             | <ul style="list-style-type: none"> <li>Multiply the coordinates by the given scale factor (k)</li> <li>Pre-image and image are NOT congruent; they are similar.</li> <li>Dilations are NOT rigid motions</li> </ul>  | <p><del>X</del> A. Find the coordinates of the new vertices of the image that has been dilated by a factor of 5.</p> <p><math>R(-4, 5) \rightarrow R'(-20, 25)</math></p> <p><math>A(-1, 1) \rightarrow A'(-5, 5)</math></p> <p><math>T(-4, -2) \rightarrow T'(-20, -10)</math></p>                           | <p><del>X</del> Find the scale factor of the outside image if the inside figure is the pre-image. (smaller to larger) &gt;&gt;&gt; see next page</p>   |

|                                  |  |  |  |
|----------------------------------|--|--|--|
|                                  |  | <p><b>X</b> Find the coordinates of the new vertices of the image that has been dilated by a factor of <math>\frac{1}{2}</math>.</p> <p><math>U(2, 4) \rightarrow U'(1, 2)</math><br/> <math>R(4, -6) \rightarrow R'(2, -3)</math><br/> <math>P(-2, 2) \rightarrow P'(-1, 1)</math></p>                                      | <p><math>A(4, 2)</math><br/> <math>B(2, 1)</math><br/>     Dilation of 2</p>   |
| <p>Multiple Transformations.</p> | <ul style="list-style-type: none"> <li>ORDER IS IMPORTANT</li> <li>Use the <i>previous</i> ordered pairs to do the next transformation.</li> </ul>                   | <p>9. Given the points <math>M(-3, 1)</math> <math>S(5, -2)</math></p> <p>Translate: <math>(x - 3, y + 2)</math><br/>         Reflect: over y-axis</p> <p><math>M' \rightarrow (-6, 3)</math><br/> <math>S' \rightarrow (2, 0)</math><br/> <math>M'' \rightarrow (6, 3)</math><br/> <math>S'' \rightarrow (-2, 0)</math></p> | <p>10. Given the points <math>K(0, -4)</math> <math>P(-6, -3)</math> <math>R(1, 2)</math></p> <p>Reflect: over the x-axis<br/>         Rotate: 270 CCW <math>90</math> CW</p> <p><math>K' \rightarrow (0, 4)</math><br/> <math>P' \rightarrow (-6, 3)</math><br/> <math>R' \rightarrow (1, -2)</math><br/> <math>K'' \rightarrow (4, 0)</math><br/> <math>P'' \rightarrow (3, 6)</math><br/> <math>R'' \rightarrow (2, 1)</math></p> |
| <p>Angles of a triangle</p>      | <ul style="list-style-type: none"> <li>Angles add up to 180</li> <li>The exterior angle of a triangle is equal to the sum of the 2 remote interior angles</li> </ul> | <p>11. The angles of a triangle measure <math>x+14</math>, <math>4x-2</math>, and <math>5x+8</math>. Solve for <math>x</math> and find the 3 angle measures.</p> <p><math>X = 16</math><br/>         Angles <math>30, 62, 92</math></p> <p>13. <br/> <math>X = 25</math></p>   | <p>12. Given the sides lengths, find the interval of the 3<sup>rd</sup> side</p> <p>a. 5 and 8 <math>3 &lt; X &lt; 13</math><br/>         b. 10 and 11 <math>1 &lt; X &lt; 21</math></p> <p>14. <br/> <math>X = 64</math></p>  |

⑪  $x + 14 + 4x - 2 + 5x + 8 = 180$

$$10x + 20 = 180$$

$$10x = 160$$

$$x = 16$$

⑬  $25 + x + 15 = 3x - 10$

$$40 + x = 3x - 10$$

$$50 = 2x$$

$$25 = x$$

⑭  $x + 60 = 2x - 4$

$$64 = x$$

16

$$2x + 20 + 3x + 45$$

$$5x + 65 = 180$$

$$5x = 115$$

$$x = 23$$

20  $82 = 2x + 10$

$$72 = 2x$$

$$36 = x$$

- Parallel lines cut by a transversal forms congruent and supplementary angles

- Angle relationships can be vertical, adjacent, alternate interior, alternate exterior, corresponding, same-side interior, and same-side exterior.

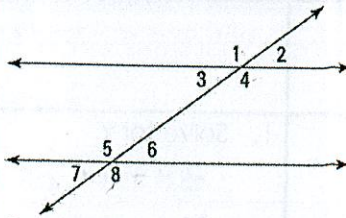
21  $5x + 10 + 3x + 2$

$$8x + 12 = 180$$

$$8x = 168$$

$$x = 21$$

15.



Congruent angles:

1 and 4, 5, 8

2 and 3, 6, 7

Supplementary angles:

Angle 1 and 3, 7, 2

Angle 2 and 1, 4, 8

16. If  $\angle 3 = 2x + 20$  and  $\angle 5 = 3x + 45$ , solve for  $x$  and find angles 5 and 3.

$$x = 23$$

$$\angle 3 = 66$$

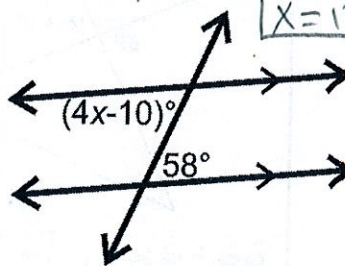
$$\angle 5 = 114$$

17. a. Solve for  $x$ .

$$4x - 10 = 58$$

$$4x = 68$$

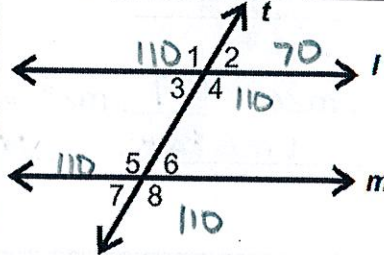
$$x = 17$$



18. If  $m\angle 5 = 110$ , find

$$m\angle 8 = 110 \quad m\angle 4 = 110$$

$$m\angle 2 = 70 \quad m\angle 7 = 70$$



19. Relationships:

Angles 1 and 8: AEA  $\cong$

Angles 1 and 5: Corr.  $\cong$

Angles 4 and 8: Corr  $\cong$

Angles 3 and 6: AIA  $\cong$

Angles 7 and 6: VA  $\cong$

Angles 7 and 8: LP  $= 180$

Angles 3 and 5: SSI  $= 180$

Angles 2 and 8: SSS  $= 180$

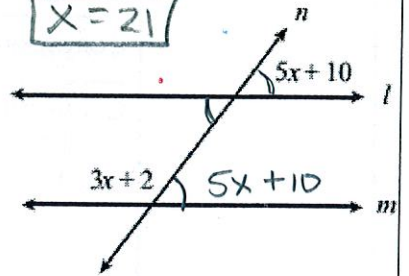
20. If  $\angle 6 = 82$  and  $\angle 3 = 2x + 10$ , find  $x$  and angles 6 and 3.

$$x = 36 \quad m\angle 6 = 82$$

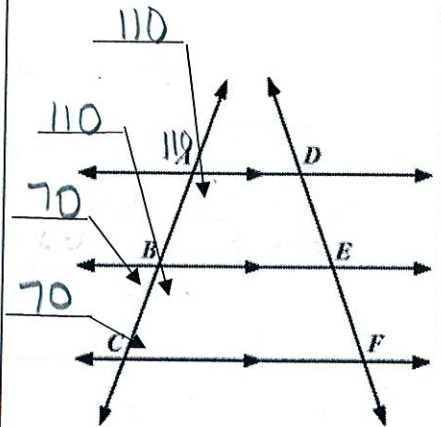
$$m\angle 3 = 82$$

21. Solve for  $x$ .

$$x = 21$$



22. a. If  $\angle A = 110$ , find the angles the arrows are pointing to.

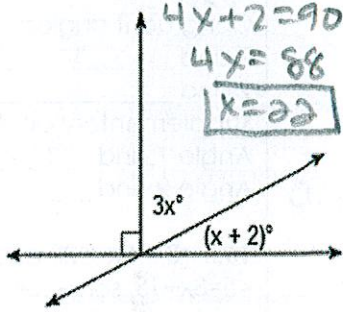
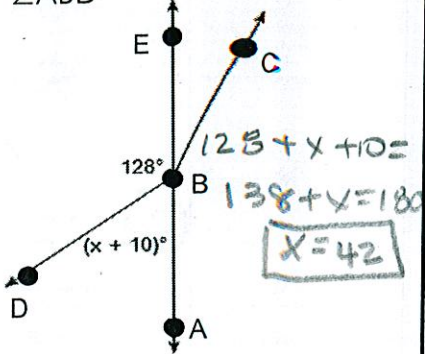
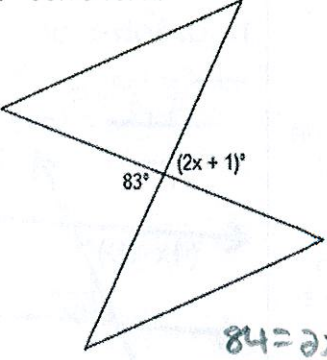


Special angle relationships

Name: \_\_\_\_\_

Date: \_\_\_\_\_

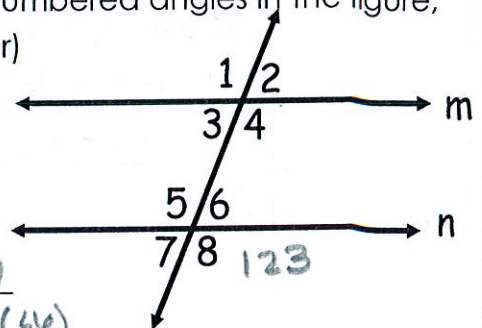
Use the following to review for you test. **Show your work on a separate sheet of paper if needed.**

| Things to Know                    | Things to Remember  | Examples   |   |
|-----------------------------------|---|--|---|
| <p>Solving for missing angles</p> | <p>Linear Pair –<br/>                     ____ + ____ = 180°<br/>                     Supplementary Angles<br/>                     ____ + ____ = 180°<br/>                     Complementary Angles<br/>                     ____ + ____ = 90°<br/>                     Vertical Angles<br/>                     ____ = ____<br/>                     Alternate Interior Angles<br/>                     ____ = ____<br/>                     Alternate Exterior Angles<br/>                     ____ = ____<br/>                     Corresponding Angles<br/>                     ____ = ____<br/>                     Consecutive Interior Angles<br/>                     ____ + ____ = 180°</p> | <p>1. Solve for x.</p> $3x + x + 2 = 90$ $4x + 2 = 90$ $4x = 88$ $x = 22$  | <p>3. Solve for x, and the measure of <math>\angle ABD</math></p>  $128 + x + 10 = 180$ $138 + x = 180$ $x = 42$   |
|                                   |   | <p>2. Solve for x.</p>  $83 = 2x + 1$ $84 = 2x$ $41 = x$                  | <p>4. One of two supplementary angles is 98° greater than its supplement. Find the measure of both angles.</p> $m\angle 1 = x + 98$ $2x + 98 = 180$ $2x = 82$ $x = 41$ <p>5. <math>\angle 1</math> and <math>\angle 2</math> are complementary angles. Solve for x and the measure of both angles.</p> $\angle 1 = 7x + 20$ $\angle 2 = 17x - 2$ $24x + 18 = 90$ $24x = 72$ $x = 3$ |

6. Given  $m \parallel n$ ,  $m\angle 8 = 123^\circ$ , find the measures of all the numbered angles in the figure, and give the reason why (vocab in things to remember)

$m\angle 1 = 123$ ,  $m\angle 2 = 57$ ,  $m\angle 3 = 57$   
VA  $\cong$       Corr  $\cong$       VA  $\cong$   
                   (LA)                   (LA)

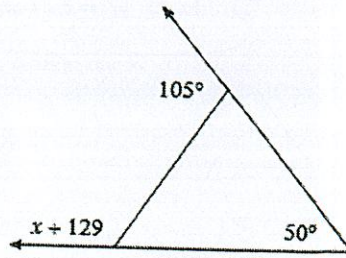
$m\angle 4 = 123$ ,  $m\angle 5 = 123$ ,  $m\angle 6 = 57$ ,  $m\angle 7 = 57$   
VA  $\cong$       VA  $\cong$       Linear Pair      VA  $\cong$  (LA)



Sum of Interior & Exterior Angles

The sum of all interior angles is  $180^\circ$ .  
 $\angle 1 + \angle 2 + \angle 3 = 180^\circ$   
 The sum of a straight line is  $180^\circ$ .

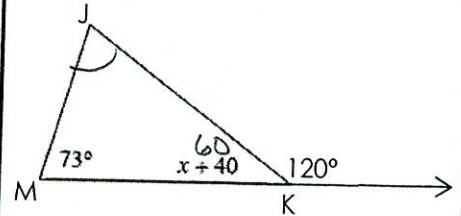
7. Solve for  $x = -4$



$$x + 129 = 50 + 75$$

$$x = -4$$

8. Solve for  $x = 20$  and  $\angle J = 47$



$$x + 40 = 60$$

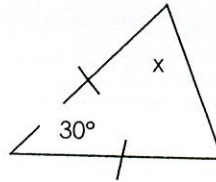
$$x = 20$$

Base Angles

-If 2 angles in a triangle are congruent, then the sides opposite them are congruent.

-If 2 sides in a triangle are congruent, then the angles opposite them are congruent.

11. Solve for x.

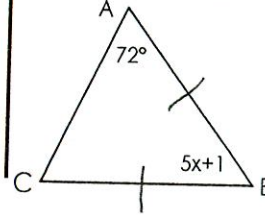


$$30 + 2x = 180$$

$$2x = 150$$

$$x = 75$$

12.  $\triangle ABC$  is an isosceles triangle with AB and BC as the legs. Solve for x.



$$5x + 1 + 72 + 72 = 180$$

$$5x + 145 = 180$$

$$5x = 35$$

$$x = 7$$

