

## Notes, Reminders, Formula

## Examples

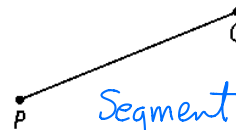
Collinear w/  $G \neq K$  is N

Non-collinear w/  $G+K$  is  $H, F, J, L + M$

**a.**

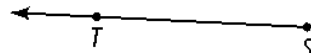
Line  $\overleftrightarrow{CD}$

**b.**



Segment  $\overline{PC}$

**c.**



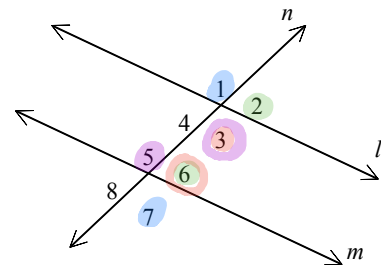
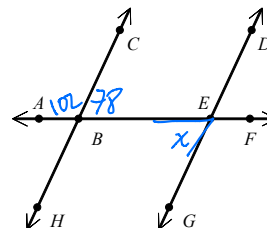
Ray  $\overrightarrow{ST}$  or  $\overleftarrow{TS}$

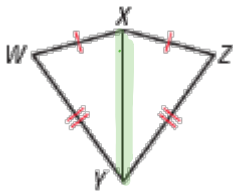
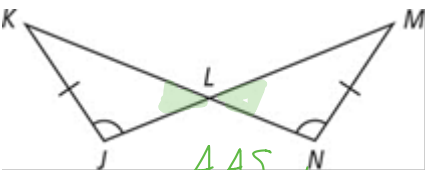
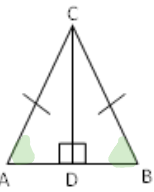
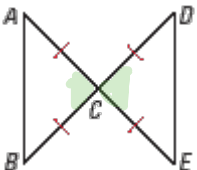
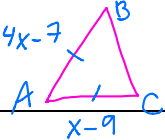
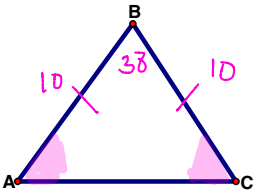
$\angle 6$  and  $\angle 2$  are Corresponding.

$<6$  and  $<3$  are consecutive interval.

$\angle 1$  and  $\angle 7$  are alternate exterior.

$\angle 3$  and  $\angle 5$  are alternate interior.


$$m\angle BEG = x = 78$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-8 - 5}{5 - 4} = \frac{-13}{1} = -13$$

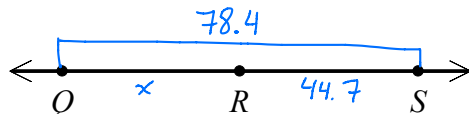
<p>parallel means same slope</p>	<p>6. A line parallel to <math>y = -\frac{4}{5}x + 2</math> is _____.</p> <p>[A] <math>y = \frac{5}{4}x + 2</math>    <del>B</del> <math>y = -\frac{4}{5}x - 3</math>    [C] <math>y = \frac{4}{5}x - 2</math>    [D] <math>y = -\frac{5}{4}x + 3</math></p>
<p>perpendicular ① flipped ② opposite sign</p>	<p>7.) A line perpendicular to <math>y = -\frac{4}{5}x + 2</math> is _____. <math>m_{\perp} = \frac{5}{4}</math></p> <p>[A] <math>y = \frac{5}{4}x + 2</math>    [B] <math>y = -\frac{4}{5}x - 3</math>    [C] <math>y = \frac{4}{5}x - 2</math>    [D] <math>y = -\frac{5}{4}x + 3</math></p>
	<p>8. Match the property to the appropriate statement.</p> <p>A. <math>\overline{RT} \cong \overline{RT}</math>    E. a) Reflexive Property of Equality</p> <p>B. If <math>\angle YER \cong \angle IOP</math> and <math>\angle IOP \cong \angle WXZ</math> then <math>\angle YER \cong \angle WXZ</math>    A. b) Reflexive Property of Congruence</p> <p>C. If <math>\overline{PQ} \cong \overline{MN}</math> then <math>\overline{MN} \cong \overline{PQ}</math>    F. c) Symmetric Property of Equality</p> <p>D. If <math>XT = YZ</math> and <math>YZ = UP</math> then <math>XT = UP</math>    C. d) Symmetric Property of Congruence</p> <p>E. <math>m\angle 1 = m\angle 1</math>    D. e) Transitive Property of Equality</p> <p>F. If <math>m\angle RQS = m\angle TEF</math> then <math>m\angle TEF = m\angle RQS</math>    B. f) Transitive Property of Congruence</p>
	<p>9. Refer to the figures shown. Give a <b>congruence statement</b> for the two triangles and name the theorem or <b>postulate</b> that proves the congruence.</p> <p>a.  <math>\text{SSS} \cong</math></p> <p>b.  <math>\text{AAS} \cong</math></p> <p>c.  <math>\text{AAS}</math></p> <p>d.  <math>\text{SAS}</math></p>
	<p>10.a) What is the measure of each base angle of an isosceles triangle if its vertex angle <math>B</math> measures <math>38^\circ</math> and its 2 congruent sides measure 10 units?</p> <p><math>x + x + 38 = 180</math>    <math>x = 71</math>  <math>2x + 38 = 180</math>  <math>2x = 142</math></p> <p>b. In this triangle, <math>\overline{AB} \cong \overline{AC}</math>. If <math>AB = 4x - 7</math> and <math>AC = x + 9</math>, Find <math>x</math>, <math>AB</math>, and <math>AC</math>.</p> <p> <math>4x - 7 = x + 9</math>  <math>3x = 16</math>  <math>x = 5.33</math> or <math>\frac{16}{3}</math></p> <p></p>

# MIDTERM REVIEW #2

Notes,  
Reminders,  
Formula

## Examples

11. If  $RS = 44.7$  and  $QS = 78.4$ , find  $QR$ .



$$x + 44.7 = 78.4$$

$$x = 33.7$$

12. Use the diagram to answer the questions.

(a) Determine the coordinates of D, F, and E.

$$D(2, 1) \quad F(4, -2) \quad E(5, 1)$$

(b) Translate  $\triangle DEF$   $(x-5, y+4)$ . Write the coordinates of the image  $D'$ ,  $F'$ , and  $E'$ .

$$D'(-3, 5) \quad F'(-1, 2) \quad E'(0, 5)$$

(c) Reflect  $\triangle DEF$  over x-axis. Write the coordinates of the image  $A'$ ,  $C'$ , and  $B'$ .

$$A'(-3, -5) \quad C'(-1, -2) \quad B'(0, -5)$$

(d) Rotate  $\triangle DEF$  90 degrees counterclockwise about the origin. Write the coordinates of the image  $K'$ ,  $O'$ , and  $M'$ .

$$K'(-1, 2) \quad O'(2, 4) \quad M'(-1, 5)$$

(e) Write the coordinates of the image after  $D_2(x, y)$ .

$$D_2(4, 2) \quad F_2(8, -4) \quad E_2(10, 2)$$

(f) Find perimeter of  $\triangle DEF$

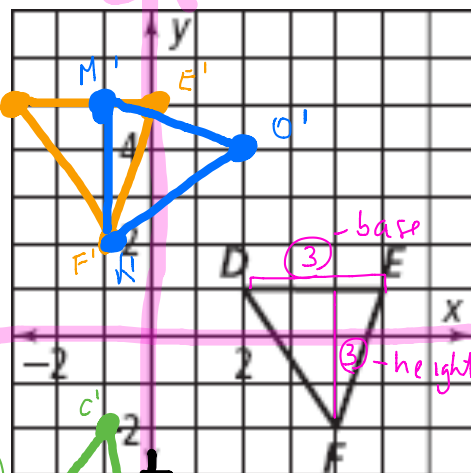
$$P_{\triangle DEF} = DE + EF + DF = 3 + (\sqrt{3^2 + 1^2}) + (\sqrt{2^2 + 3^2}) = 3 + \sqrt{10} + \sqrt{13}$$

(g) Find the area of  $\triangle DEF$

$$A_{\triangle DEF} = \frac{1}{2}(\text{base})(\text{height}) = \frac{1}{2}(3)(3) = \frac{9}{2} = 4.5$$

(h) Are  $\triangle DEF$  and  $\triangle D'E'F'$  similar? Explain.

Yes, AA similarity



13. Find the value of x and y.

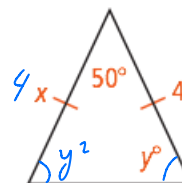
$$x = 4$$

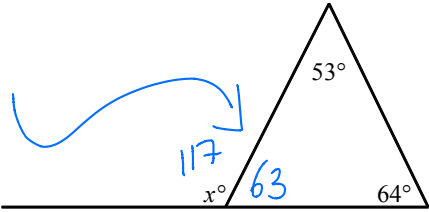
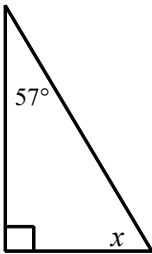
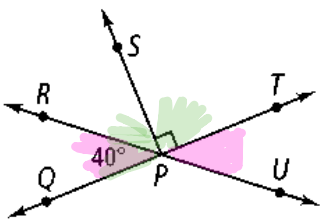
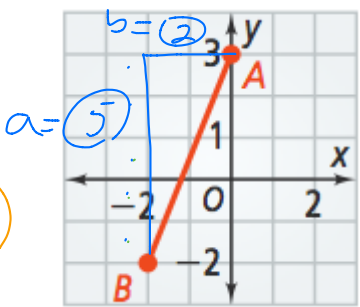
$$y + y + 50 = 180$$

$$2y + 50 = 180$$

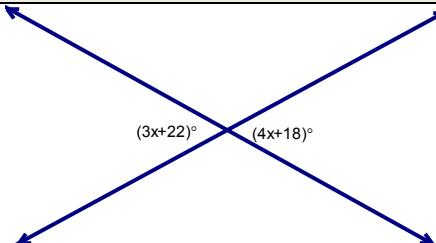
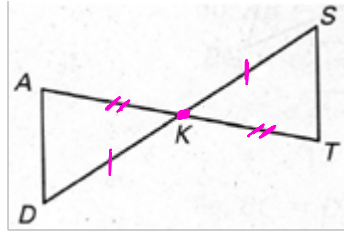
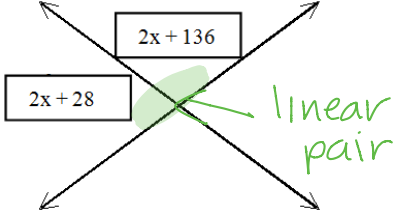
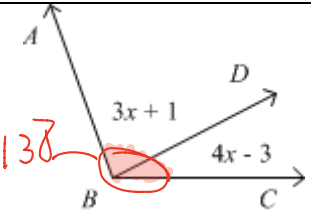
$$2y = 130$$

$$y = 65$$



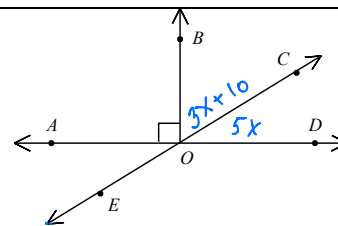
	<p>14. In triangle NLM, <math>m\angle NLM = (2x + 7)^\circ</math> and <math>m\angle KLM = (x - 2)^\circ</math> and <math>m\angle MLN = 60^\circ</math>. Find <math>m\angle NLM</math> and <math>m\angle KLM</math>.</p>
	<p>15. If the midpoint of QR is M(1, 5) and one endpoint is R(7, 4), find the coordinates of the other endpoint.</p> $M(1, 5) = \left( \frac{x+7}{2}, \frac{y+4}{2} \right)$ $1 = \frac{x+7}{2} \quad 5 = \frac{y+4}{2}$ $2 = x+7 \quad 10 = y+4$ $-5 = x \quad 6 = y$ <p><math>Q(-5, 6)</math></p>
<p>Remote angle theorem</p>	<p>16.) Find the value of x.</p> <p><math>x = 53 + 64</math> <span style="border: 1px solid black; padding: 2px;">OR</span></p> <p><math>x = 117</math></p> 
	<p>17.) Find the value of x.</p>  $180 = 57 + 90 + x$ $180 = 147 + x$ $33 = x$
	<p>18. Find <math>m\angle SPQ</math> and <math>m\angle TPU</math>.</p> <p><math>m\angle RPQ = m\angle TPU = 40</math> vertical angles</p> <p><math>m\angle SPT = m\angle SPQ = 90</math> linear pair</p> 
	<p>19. (a) Find the distance between points A and B.</p> $a^2 + b^2 = c^2$ $5^2 + 2^2 = c^2$ $c^2 = 25 + 4$ $c = \sqrt{29}$ <p>(b) Find the midpoint of segment AB.</p> $M = \left( \frac{-2+0}{2}, \frac{-2+3}{2} \right) = \left( \frac{-2}{2}, \frac{1}{2} \right) = \left( -1, \frac{1}{2} \right)$ 

MIDTERM REVIEW #3

Notes, Reminders, Formula	Examples												
	<p>20. Solve for x.</p>  <p><math>3x+22 = 4x+18</math> <math>4 = x</math></p>												
	<p>21. Given: <math>\overline{DK} \cong \overline{SK}</math>, <math>K</math> is mid-point of <math>\overline{AT}</math>. Prove: <math>\overline{AD} \cong \overline{ST}</math></p> <table border="1" data-bbox="397 619 1063 1037"> <thead> <tr> <th>Statement</th><th>Reason</th></tr> </thead> <tbody> <tr> <td>① <math>\overline{DK} \cong \overline{SK}</math> <math>K</math> is midpoint <math>\overline{AT}</math></td><td>① given</td></tr> <tr> <td>② <math>\overline{AK} \cong \overline{KT}</math></td><td>② Def of midpoint</td></tr> <tr> <td>③ <math>\angle AKD \cong \angle TKS</math></td><td>③ Vertical <math>\angle</math>'s</td></tr> <tr> <td>④ <math>\triangle AKD \cong \triangle TKS</math></td><td>④ SAS</td></tr> <tr> <td>⑤ <math>\overline{AD} \cong \overline{ST}</math></td><td>⑤ Def of <math>\cong</math> triangles</td></tr> </tbody> </table> 	Statement	Reason	① $\overline{DK} \cong \overline{SK}$ $K$ is midpoint $\overline{AT}$	① given	② $\overline{AK} \cong \overline{KT}$	② Def of midpoint	③ $\angle AKD \cong \angle TKS$	③ Vertical $\angle$ 's	④ $\triangle AKD \cong \triangle TKS$	④ SAS	⑤ $\overline{AD} \cong \overline{ST}$	⑤ Def of $\cong$ triangles
Statement	Reason												
① $\overline{DK} \cong \overline{SK}$ $K$ is midpoint $\overline{AT}$	① given												
② $\overline{AK} \cong \overline{KT}$	② Def of midpoint												
③ $\angle AKD \cong \angle TKS$	③ Vertical $\angle$ 's												
④ $\triangle AKD \cong \triangle TKS$	④ SAS												
⑤ $\overline{AD} \cong \overline{ST}$	⑤ Def of $\cong$ triangles												
	<p>22. Solve for x.</p> <p><math>2x+28 + 2x+136 = 180</math> <math>4x+164 = 180</math> <math>4x = 16</math> <math>x = 4</math></p> 												
	<p>23. Give the slope and a point for the line <math>y-4 = 3(x+2)</math></p> <p><math>m = 3</math> <math>y\text{-int} = 10</math></p> <p><math>y-4 = 3x+6 \rightarrow y = 3x+10</math></p>												
	<p>24.a. Name the <del>three</del> <sup>three</sup> classifications of triangles by sides and their definitions. Isosceles, scalene, equilateral</p> <p>b. Name the <del>four</del> <sup>four</sup> classifications of triangles by angles and their definitions. acute, obtuse, right, &amp; equiangular</p>												
	<p>25. Given: <math>m\angle ABC = 138</math>. Find x.</p> <p><math>3x+1+4x-3 = 138</math> <math>7x-2 = 138</math> <math>7x = 140</math> <math>x = 20</math></p> 												

26. Given  $m\angle BOC = 3x + 10$  and  $m\angle COD = 5x$   
Find  $x$ .

$$\begin{aligned} 3x + 10 + 5x &= 90 \\ 8x + 10 &= 90 \\ 8x &= 80 \end{aligned} \quad \rightarrow x = 10$$



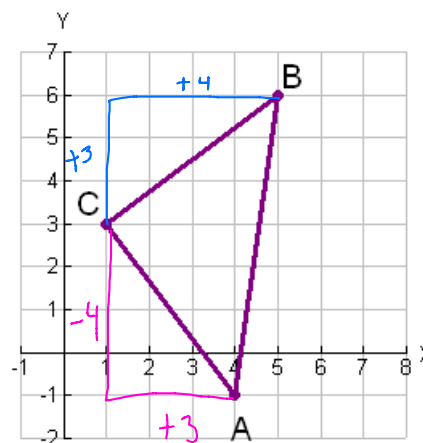
27. Use the graph on the right to answer the following questions:

(a) Find the slope of segment BC and AC.

$$BC = \frac{\text{rise}}{\text{run}} = \frac{3}{4}$$

$$AC = \frac{\text{rise}}{\text{run}} = -\frac{4}{3}$$

(b) Are segment BC and AC parallel, perpendicular or neither? Why?



$\left(-\frac{4}{3}\right)\left(\frac{3}{4}\right) = -1$  Parallel b/c slopes are  
① opposite sign ② flipped } negative reciprocals

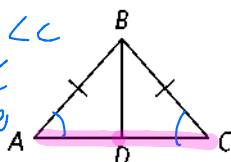
(c) Classify the triangle by angles.

Since AC & BC are  $\perp$   
then  $\triangle$  is a right triangle

28. Determine what other information you need to prove the two triangles congruent using the given congruence postulate or theorem.

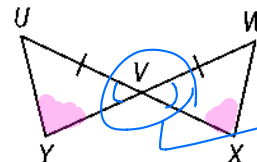
a. SAS

$m\angle A = m\angle C$   
b/c  $\triangle ABC$   
is isosceles



So need  $AD \cong DC$

AAS



vertical angles  
 $\angle UYV \cong \angle WXV$   
need  $\angle UVY \cong \angle WVX$

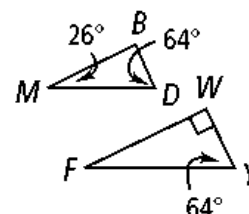
29. Using the diagram on the right, what can you say about the triangles?

a. They are congruent.

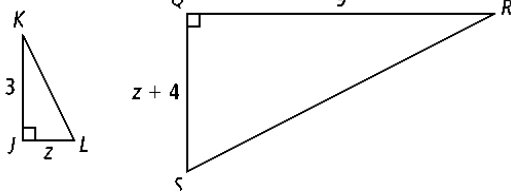
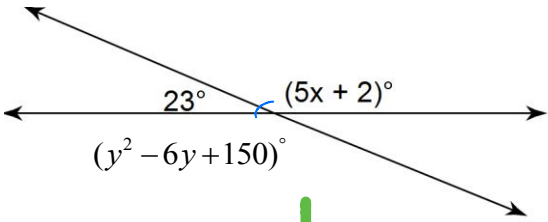
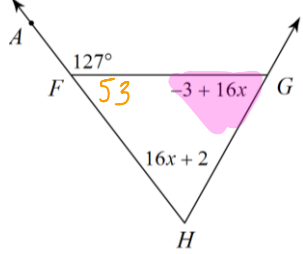
b. They are similar.

c. Neither a nor b.

d. Both a and b



MIDTERM REVIEW #4

Notes, Reminders, Formula	Examples
	<p>30. <math>\triangle JKL \sim \triangle QRS</math>. Find <math>x</math>.</p> <p> <math>\frac{3}{z} = \frac{9}{z+4}</math>  <math>3(z+4) = 9z</math>  <math>3z + 12 = 9z</math>  <math>12 = 6z</math>  <math>2 = z</math> </p> 
	<p>31. Proportion solving for <math>x</math></p> <p> <math>\frac{9}{x} = \frac{4x}{9}</math>  <math>\sqrt{81} = \sqrt{4x^2}</math>  <math>\pm 9 = 2x</math>  <math>\pm \frac{9}{2} = x</math> </p>
	<p>32. Find all possible values for <math>x</math> and <math>y</math>.</p>  <p> <math>23 + 5x + 2 = 180</math>  <math>5x + 25 = 180</math>  <math>5x = 155</math>  <math>x = 31</math> </p> <p> <math>y^2 - 6y + 150 + 23 = 180</math>  <math>y^2 - 6y + 173 = 180</math>  <math>y^2 - 6y - 7 = 0</math>  <math>(y - 7)(y + 1) = 0</math>  <math>y = 7</math> or <math>y = -1</math> </p>
	<p>33. Find the value of <math>m\angle FGH</math></p> <p> <math>53 - 3 + 16x + 16x + 2 = 180</math>  <math>32x + 52 = 180</math>  <math>32x = 128</math>  <math>x = 4</math> </p> <p> <math>m\angle FGH = -3 + 16x</math>  <math>= -3 + 16(4) = 61</math> </p> 

34. Write the equation of the line perpendicular to the line  $y - 3 = 2(x - 4)$  and through the point  $(-2, 5)$

So  $\perp$  equation through  $(-2, 5)$

$$5 = -\frac{1}{2}(-2) + b \rightarrow 4 = b$$

$$5 = 1 + b \rightarrow \text{SO: } y_{\perp} = -\frac{1}{2}x + 4$$

$$y - 3 = 2x - 8$$

$$y = 2x - 5$$

$$m_{\perp} = -\frac{1}{2}$$

35. Given the equation of the line  
 $3x + 6y = 24$

a) Write the equation of the line in slope-intercept form

$$3x + 6y = 24$$

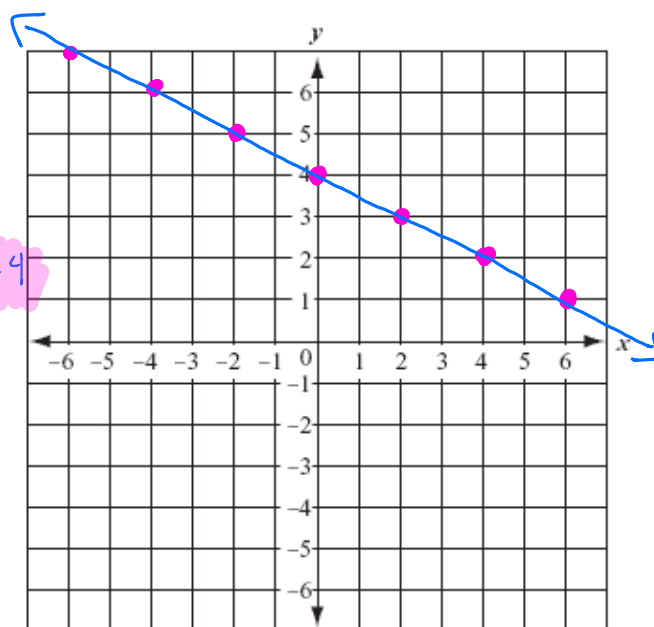
$$6y = -3x + 24$$

$$y = -\frac{3}{6}x + \frac{24}{6} \Rightarrow y = -\frac{1}{2}x + 4$$

b) What are the slope and y-intercept of the line?

$$\text{slope} = m = -\frac{1}{2}$$

$$y\text{-int} = b = 4$$



c) Give the coordinates of one point on the line.

$(-6, 7), (-4, 6), (-2, 5)$

$(0, 4), (2, 3), (4, 2)$  etc

d) Use the slope and your point to write the equation of the line in point-slope form

Remember

$$y - y_1 = m(x - x_1)$$

$$y - 3 = m(x - 2)$$