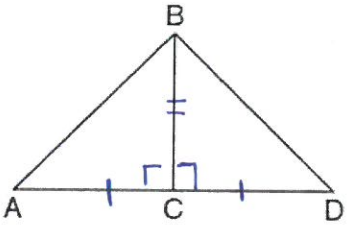
METRY
REVIEW FOR EXAM
TRIMESTER #1

Name_____

You must show your work in order to get credit for these problems. Either show work or explain your answer (even a multiple choice answer) for each problem. DOING THIS WILL HELP YOU PREPARE FOR YOUR EXAM!

1. Given: $\triangle ABD$, $\overline{BC}$ is the perpendicular bisector of $\overline{AD}$ Space given to show work or explain.



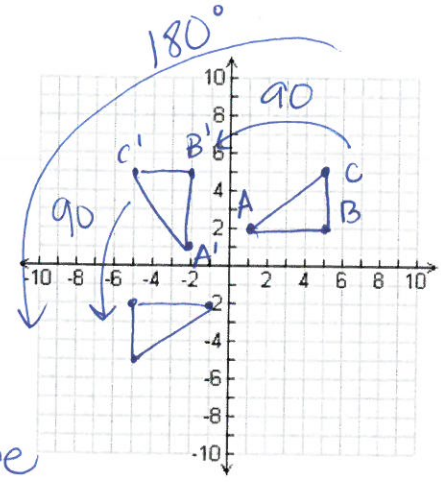
△'s are ≅ by SAS

Which statement can *not* always be proven?

(1) $\overline{AC} \cong \overline{DC}$ yes bisector
(2) $\overline{BC} \cong \overline{CD}$
(3) $\angle ACB \cong \angle DCB$ yes, both 90°
(4) $\triangle ABC \cong \triangle DBC$ yes

2. Triangle ABC has the coordinates $A(1,2)$, $B(5,2)$, and $C(5,5)$. Triangle ABC is rotated 180° about the origin to form triangle $A'B'C'$. Triangle $A'B'C'$ is

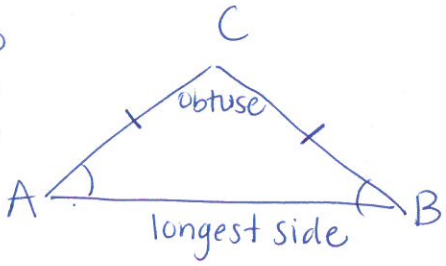
(1) acute
(2) isosceles
(3) obtuse
(4) right



rotations preserve size & shape (they're rigid)

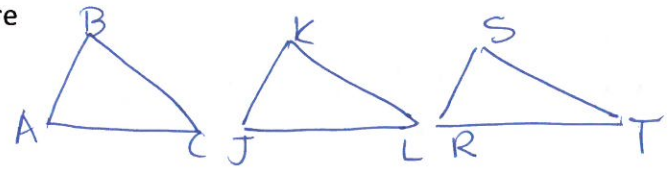
3. In $\triangle ABC$, $\angle A \cong \angle B$ and $\angle C$ is an obtuse angle. Which statement is true? Space given to show work or explain.

(1) $\overline{AC} \cong \overline{AB}$ and $\overline{BC}$ is the longest side.
(2) $\overline{AC} \cong \overline{BC}$ and $\overline{AB}$ is the longest side.
(3) $\overline{AC} \cong \overline{AB}$ and $\overline{BC}$ is the shortest side.
(4) $\overline{AC} \cong \overline{BC}$ and $\overline{AB}$ is the shortest side.



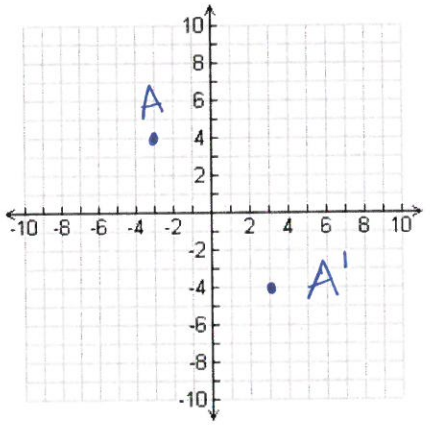
4. You are given that $\triangle ABC \cong \triangle JKL \cong \triangle RST$
Draw these triangles and give the side lengths that are congruent to $\overline{BC}$?

Space given to show work or explain.



$\overline{BC} \cong \overline{KL} \cong \overline{ST}$

5. What are the coordinates of A', the image of point $A(-3,4)$, after a rotation of 180° about the origin?

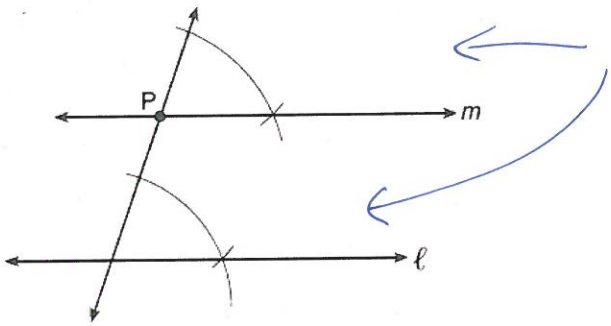


$A'(3,-4)$

$180°\ (x,y) \rightarrow (-x,-y)$

6. The diagram below shows the construction of line m, parallel to line ℓ, through point P.

Space given to show work or explain.



corresponding ∠s they are the same measure

Which theorem was used to justify this construction?

(1) If two lines are cut by a transversal and the alternate interior angles are congruent, the lines are parallel. NO

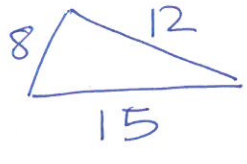
(2) If two lines are cut by a transversal and the interior angles on the same side are supplementary, the lines are parallel. NO

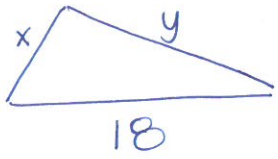
(3) If two lines are perpendicular to the same line, they are parallel. NO

(4) If two lines are cut by a transversal and the corresponding angles are congruent, they are parallel.

7. The sides of a triangle are 8, 12, and 15. The longest side of a similar triangle is 18.
   a. Draw these two triangles.
   b. Find the scale factor between these two triangles.
   c. Find the other two missing side lengths.

Space given to show work or explain.





Scale factor

$\frac{18}{15} = 1.2$

$\frac{8}{x} = \frac{15}{18}$

$18 \cdot 8 = 15 \cdot x$

$\frac{144}{15} = \frac{15x}{15}$

$x = 9.6$

$\frac{12}{y} = \frac{15}{18}$

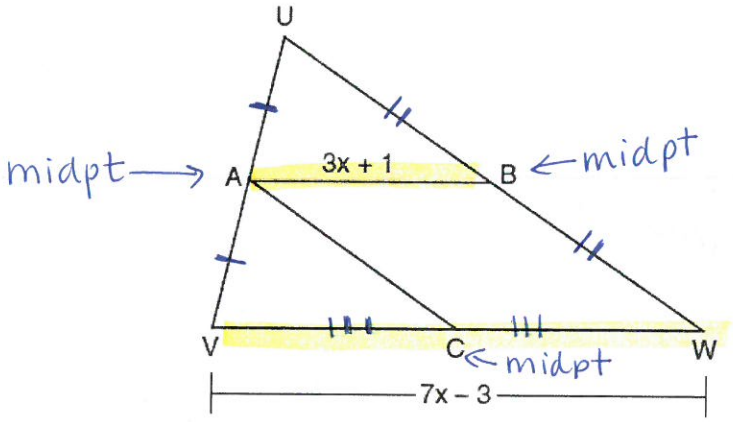
$12 \cdot 18 = 15 \cdot y$

$\frac{216}{15} = \frac{15y}{15}$

$y = 14.4$

8. In the diagram of $\triangle UVW$ below, A is the midpoint of $\overline{UV}$, B is the midpoint of $\overline{UW}$, C is the midpoint of $\overline{VW}$, and $\overline{AB}$ and $\overline{AC}$ are drawn.

Space given to show work or explain.
*(reminder=midpoints in a triangle are called **midsegments**)*



If $VW = 7x - 3$ and $AB = 3x + 1$, what is the length of $\overline{VC}$?

Side VW is twice the length of side AB

Side AB is half the length of VW

$2(3x+1) = 7x-3$

$6x + 2 = 7x - 3$

$-7x \quad -7x$

$-1x + 2 = -3$

$-2 \quad -2$

$-1x = -5$

$x = 5$

$AB = 3(5) + 1 = 16$

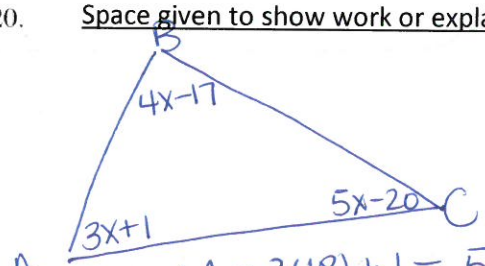
$VW = 7(5) - 3 = 32$

VC is $\frac{1}{2}$ VW so $VC = 16$

9. In $\triangle ABC$, $m\angle A = 3x + 1$, $m\angle B = 4x - 17$, and $m\angle C = 5x - 20$. Which type of triangle is $\triangle ABC$?

(1) right
(2) scalene
(3) isosceles
(4) equilateral

Space given to show work or explain.



$4x - 17 + 3x + 1 + 5x - 20 = 180$

$12x - 36 = 180$

$\frac{12x}{12} = \frac{216}{12}$

$x = 18$

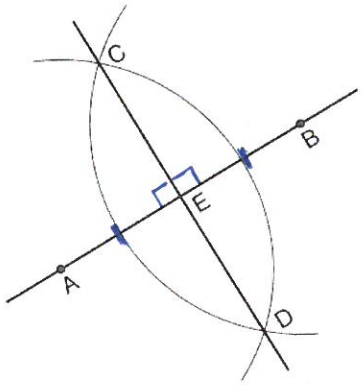
$m\angle A = 3(18) + 1 = 55°$

$m\angle B = 4(18) - 17 = 55°$

$m\angle C = 5(18) - 20 = 70°$

10. Based on the construction below, which conclusion is *not* always true?

Space given to show work or explain.



this construction is a ⊥ bisector

(1) $\overline{AB} \perp \overline{CD}$ always true

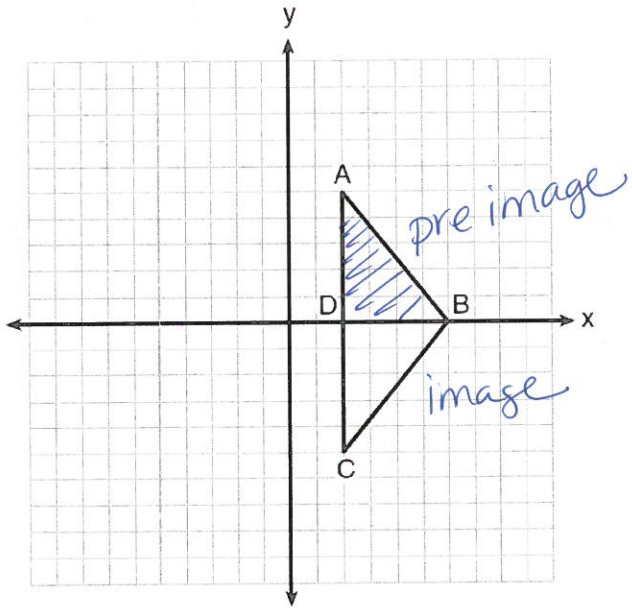
(2) $AB = CD$

(3) $AE = EB$ always true

(4) $CE = DE$ always true

11. As shown in the diagram below, when right triangle DAB is reflected over the x-axis, its image is triangle DCB.

Space given to show work or explain.



Which statement justifies why $\overline{AB} \cong \overline{CB}$?

(1) Distance is preserved under reflection.

(2) Orientation is preserved under reflection.

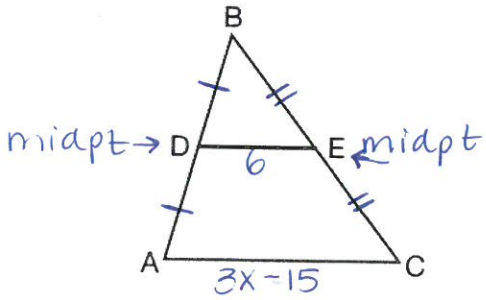
(3) Points on the line of reflection remain invariant.

(4) Right angles remain congruent under reflection.

12. In $\triangle ABC$, D is the midpoint of $\overline{AB}$ and E is the midpoint of $\overline{BC}$. If $AC = 3x - 15$ and $DE = 6$, what is the value of x?

Show work or explain.

*(reminder=midpoints in a triangle are **midsegments**)*



DE is half the distance of AC

$6 \cdot 2 = \longrightarrow 12 = 3x - 15$

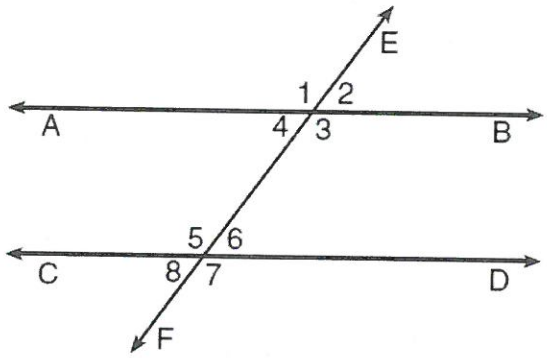
$+15 \qquad +15$

$27 = 3x$

$9 = x$

13. Transversal $\overleftrightarrow{EF}$ intersects $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$, as shown in the diagram below.

Show work or explain.



Which statement could always be used to prove $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$?

NO (1) $\angle 2 \cong \angle 4$ vertical ∠s

NO (2) $\angle 7 \cong \angle 8$ linear pair

(3) $\angle 3$ and $\angle 6$ are supplementary these are same side interior

(4) $\angle 1$ and $\angle 5$ are supplementary corresponding ∠s should be =

14. In triangles ABC and DEF, $AB = 4$, $AC = 5$, $DE = 8$, $DF = 10$, and $\angle A \cong \angle D$. Which method could be used to prove $\triangle ABC \sim \triangle DEF$?

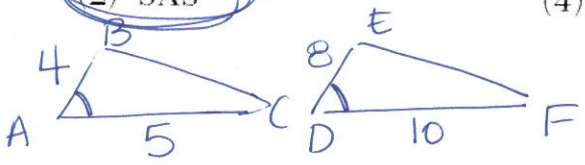
Show work or explain.

(1) AA

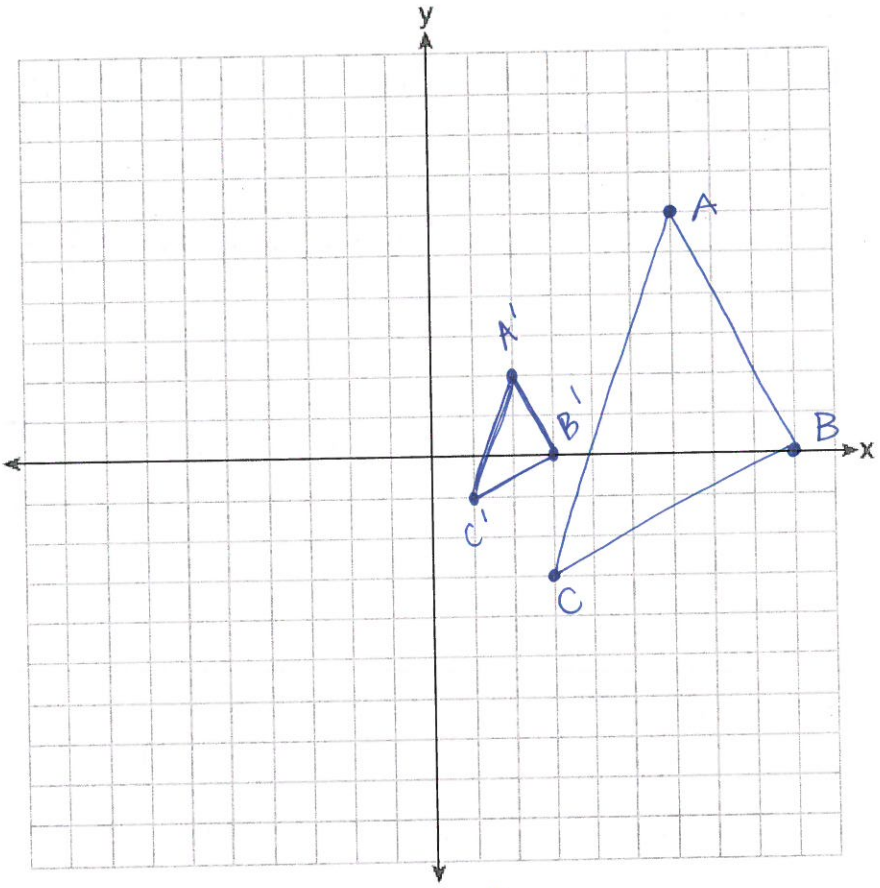
(2) SAS

(3) SSS

(4) ASA



15. Triangle ABC has vertices $A(6,6)$, $B(9,0)$, and $C(3,-3)$. State and label the coordinates of $\triangle A'B'C'$, the image of $\triangle ABC$ after a dilation of $D_{\frac{1}{3}}$.



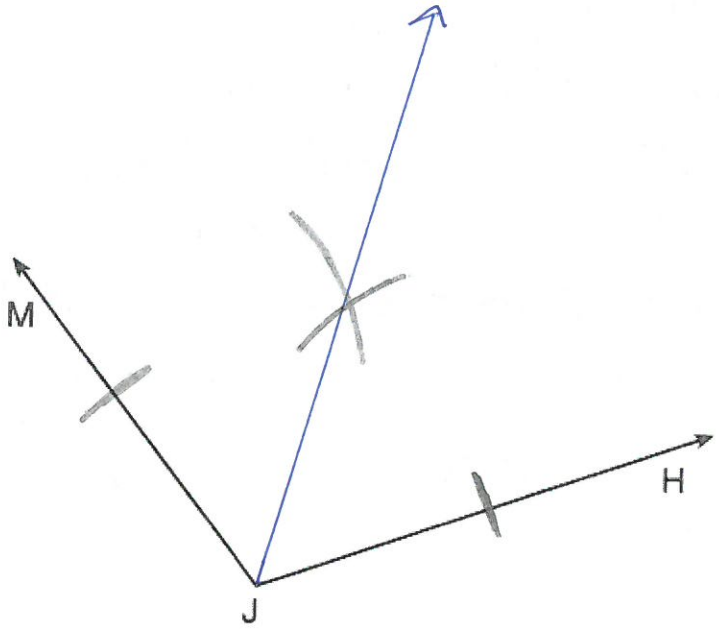
$A(6,6) \xrightarrow{\times 1/3} A'(2,2)$

$B(9,0) \xrightarrow{\times 1/3} B'(3,0)$

$C(3,-3) \xrightarrow{\times 1/3} C'(1,-1)$

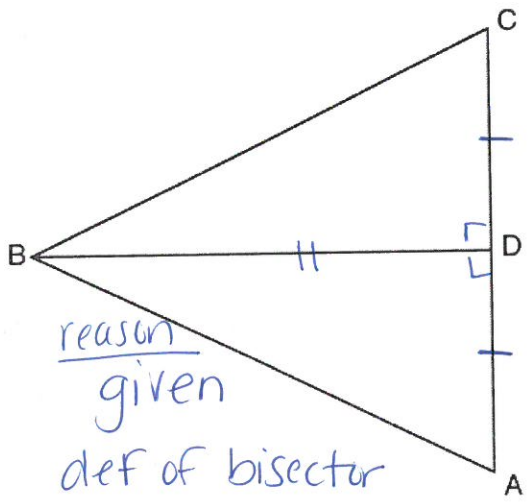
16. Using a compass and straightedge, construct the bisector of $\angle MJH$.

[Leave all construction marks.]



17. Given: $\triangle ABC$, $\overline{BD}$ bisects $\angle ABC$, $\overline{BD} \perp \overline{AC}$

Prove: $\Delta BCD \cong \Delta BAD$



statement	reason
BD bisects $\angle ABC$	given
$AD = CD$	def of bisector
$BD \perp AC$	given
$\angle CDB = \angle ADB = 90°$	def. of perpindicular
$BD = BD$	same side
$\triangle BCD \cong \triangle BAD$	SAS

Make a list of the corresponding sides and angles for the two triangles you just proved congruent.

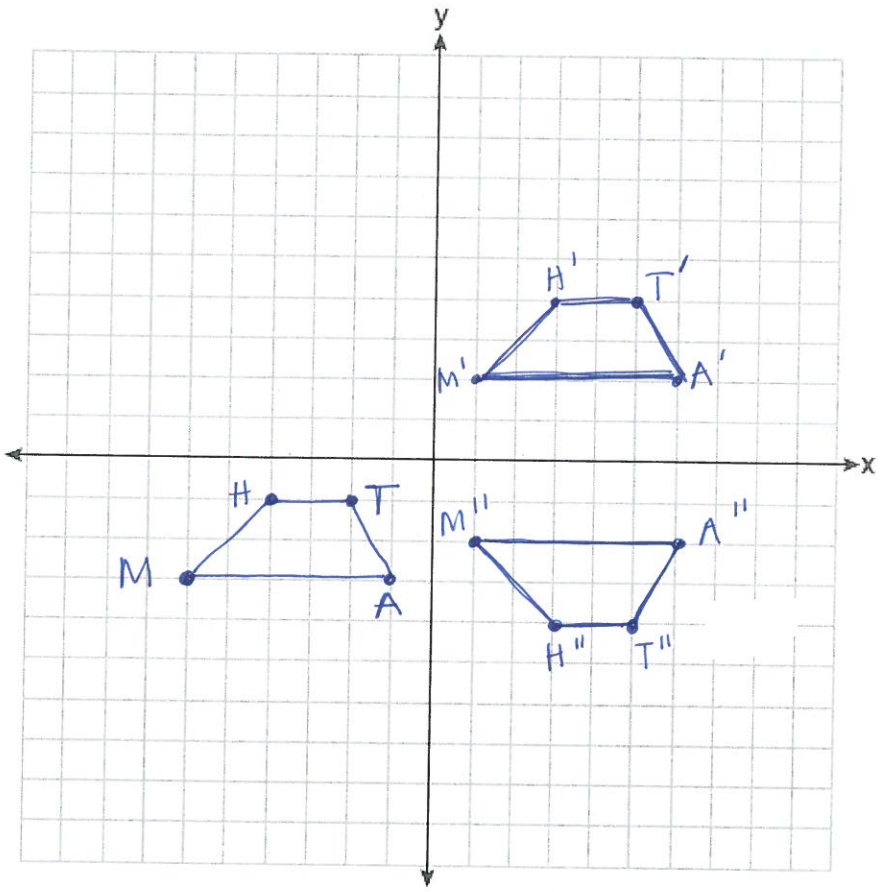
Corresponding Sides	Corresponding Angles
$\overline{AB} = \overline{CB}$	$\angle A = \angle C$
$\overline{BD} = \overline{BD}$	$\angle ADB = \angle CDB$
$\overline{CD} = \overline{AD}$	$\angle ABD = \angle CBD$

18. Quadrilateral $MATH$ has coordinates $M(-6,-3)$, $A(-1,-3)$, $T(-2,-1)$, and $H(-4,-1)$. The image of quadrilateral $MATH$ after the composition $r_{x\text{-axis}} \circ T_{7,5}$ is quadrilateral $M''A''T''H''$. State and label the coordinates of $M''A''T''H''$.

This vector is 7 units to the right and 5 units up

$(x, y) \rightarrow (x+7, y+5)$

(remember in a composition, the ∘ means "after" so the translation must be performed before the reflection)



M''(1, -2)
A''(6, -2)
T''(5, -4)
H''(3, -4)