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GEOMETRY

MIDTERM REVIEW

HOMEWORK PACKET

The homework for each night from this packet is mixed review of all material we have covered so far this year. Show all work! Use old notes, videos and study sheets to help you! You will need a compass, ruler and graphing calculator to help you!

CALENDAR

DATE	ASSIGNMENT	PAGES
1/15/20	Midterm Review HW #1	2-4
1/16/20	Midterm Review HW #2	5-6
1/17/20	Midterm Review HW #3	7-8

Midterm Review HW #1

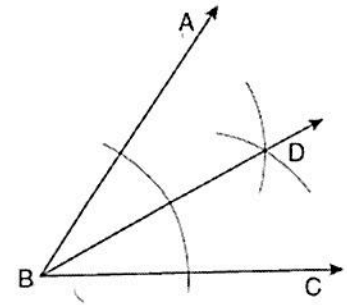
1. Based on the construction below, which statement must be true?

1) $m\angle ABD = \frac{1}{2} m\angle CBD$

2) $m\angle ABD = m\angle CBD$

3) $m\angle ABD = m\angle ABC$

4) $m\angle CBD = \frac{1}{2} m\angle ABD$



2. In the diagram below of $\triangle HQP$, side \overline{HP} is extended through P to T , $m\angle QPT = 6x + 20$, $m\angle HQP = x + 40$, and $m\angle PHQ = 4x - 5$.

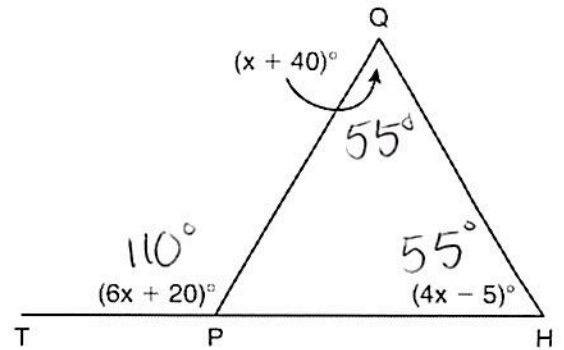
- Find $m\angle QPT$ $6(15) + 20 = 110^\circ$
- Find $m\angle HQP$ $(15) + 40 = 55^\circ$
- Find $m\angle QPH$ $4(15) - 5 = 55^\circ$

$$6x + 20 = x + 40 + 4x - 5$$

$$6x + 20 = 5x + 35$$

$$-5x - 20 - 5x - 20$$

$$x = 15$$



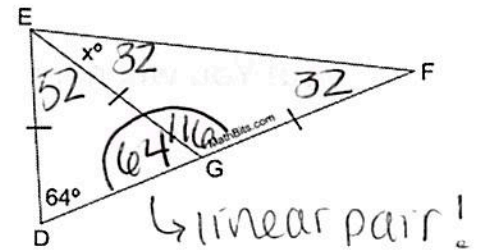
(Not drawn to scale)

3. $\triangle DEG$ and $\triangle EGF$ are isosceles. $m\angle EDG = 64^\circ$ Find $m\angle GEF$.

$$180 - (64 + 64) = 52^\circ$$

$$180 - 116 = 64 \div 2 = 32^\circ$$

$$\boxed{x = 32^\circ}$$



4. Which transformation would result in the perimeter of a triangle being different from the perimeter of its image?

DILATION!

1) $(x, y) \rightarrow (y, x)$

2) $(x, y) \rightarrow (x, -y)$

3) $(x, y) \rightarrow (4x, 4y)$

4) $(x, y) \rightarrow (x + 2, y - 5)$

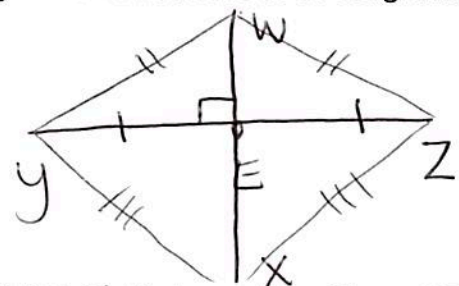
5. Segment \overline{WX} is the perpendicular bisector of \overline{YZ} at E . Which pair of segments do not have to be congruent?

(1) \overline{XE} , \overline{WE}

(3) \overline{YW} , \overline{ZW} ✓

(2) \overline{YE} , \overline{ZE} ✓

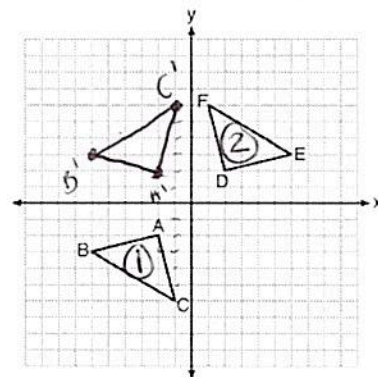
(4) \overline{YX} , \overline{ZX} ✓



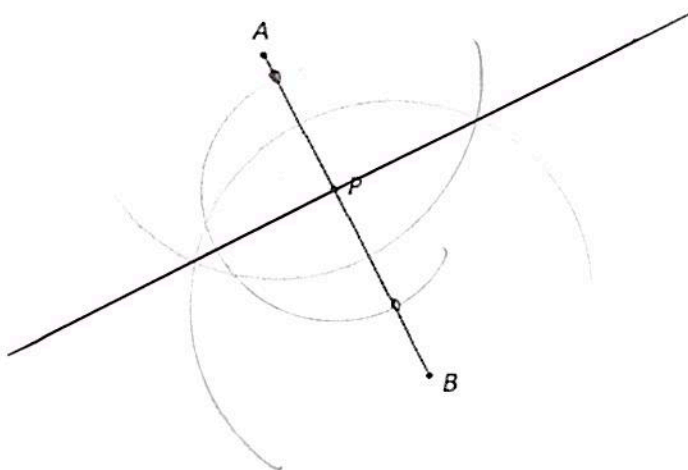
any point on the \perp bisector is equidistant from endpoints of the segment

6. Triangle ABC and triangle DEF are graphed on the set of axes below. Which sequence of transformations maps triangle ABC onto triangle DEF ?

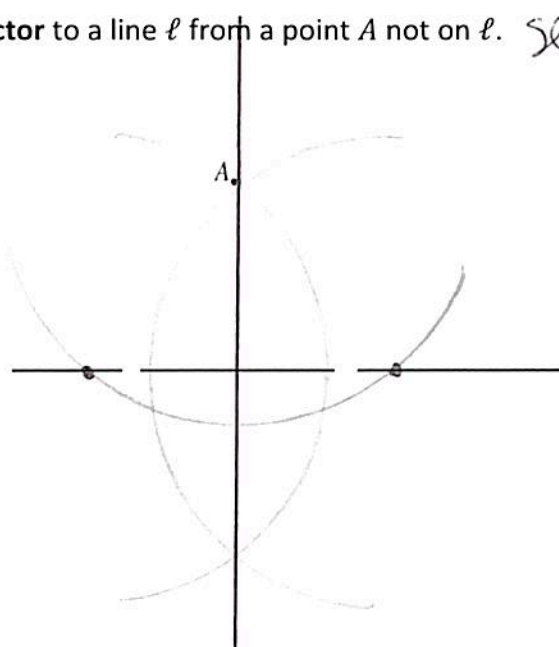
- (1) a reflection over the x -axis followed by a reflection over the y -axis
 2) a 180° rotation about the origin followed by a reflection over the line $y = x$
 3) a 90° clockwise rotation about the origin followed by a reflection over the y -axis
 4) a translation 8 units to the right and 1 unit up followed by a 90° counterclockwise rotation about the origin



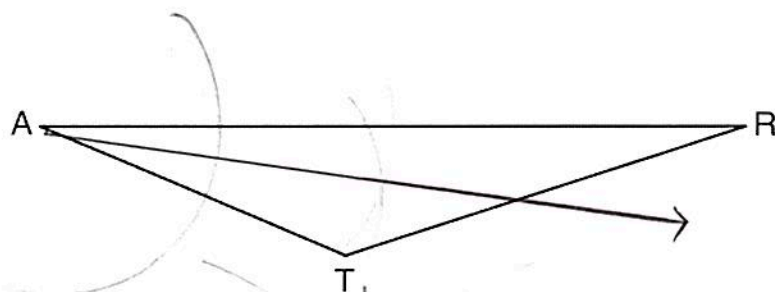
7. Construct a **line perpendicular** to segment AB that goes through point P . *semicircle first!*



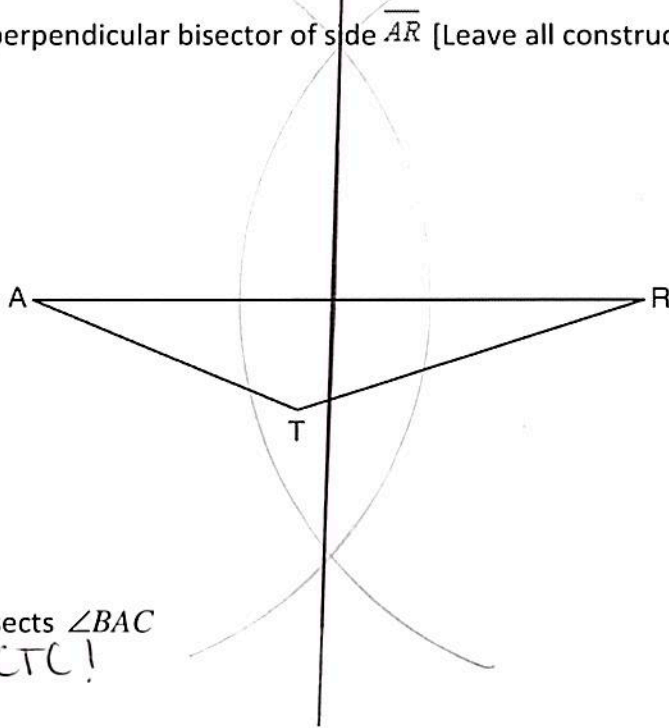
8. Construct a **perpendicular bisector** to a line ℓ from a point A not on ℓ . *semicircle first!*



9. Given: $\triangle ART$, Using a compass and straightedge, construct the bisector of $\angle RAT$. [Leave all construction marks.]

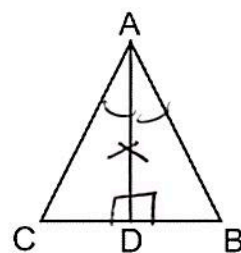


10. Given: $\triangle ART$, Construct: the perpendicular bisector of side \overline{AR} . [Leave all construction marks.]



11. Given: $\overline{AD} \perp \overline{BC}$ and \overline{AD} bisects $\angle BAC$
Prove: $\angle C \cong \angle B \rightarrow \text{CPCTC!}$

PLAN: ASA



STATEMENT

REASON

- ① $\overline{AD} \perp \overline{BC}$, \overline{AD} bisects $\angle BAC$
- ② $\angle CDA \cong \angle BDA$ (A) ✓
- ③ $\overline{AD} \cong \overline{AD}$ (S) ✓
- ④ $\angle CAD \cong \angle BAD$ (A) ✓
- ⑤ $\triangle CDA \cong \triangle BDA$
- ⑥ $\angle C \cong \angle B$

- ① Given
- ② \perp lines form \cong right \angle 's
- ③ Reflexive property
- ④ A bisector creates 2 \cong \angle 's
- ⑤ ASA \cong ASA
- ⑥ CPCTC

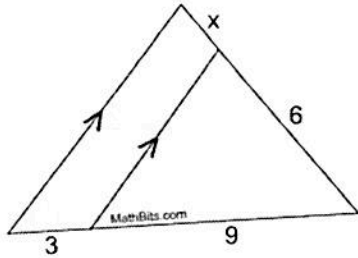
Midterm Review HW #2

12. Given the diagram below, determine the value of x.

$$\frac{6}{x} = \frac{9}{3}$$

$$9x = 18$$

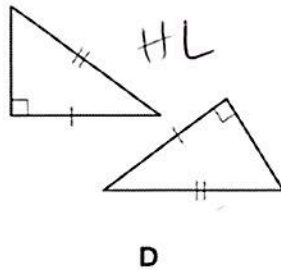
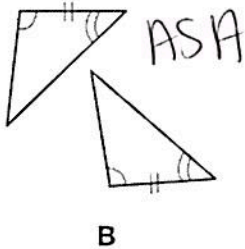
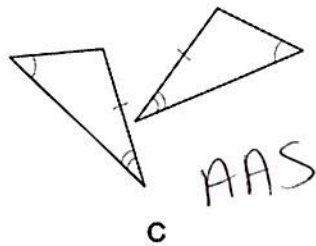
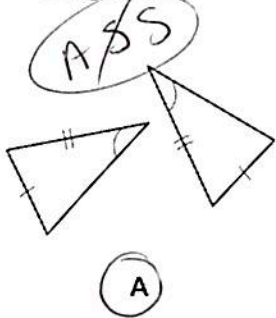
$$\boxed{x = 2}$$



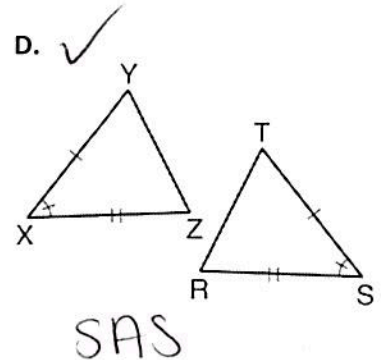
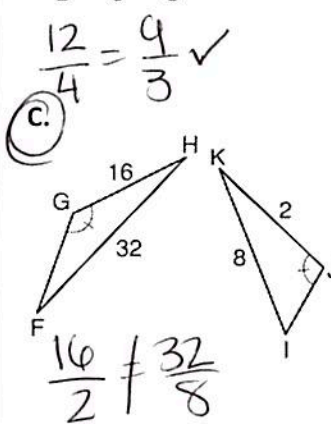
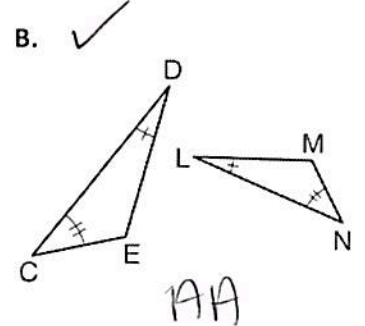
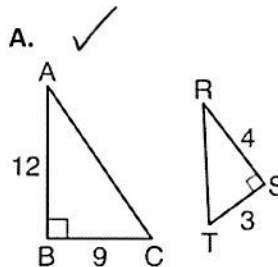
13. If $\triangle ABC \sim \triangle LMN$, which statement is not always true?

- ① $m\angle A \cong m\angle N$
- 2) $m\angle B \cong m\angle M$ ✓
- 3) $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle LMN} = \frac{(AC)^2}{(LN)^2}$ ✓
- 4) $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle LMN} = \frac{AB}{LM}$ ✓

14. In the diagram below, four pairs of triangles are shown. Congruent corresponding parts are labeled in each pair. Using only the information given in the diagrams, which pair of triangles can not be proven congruent?

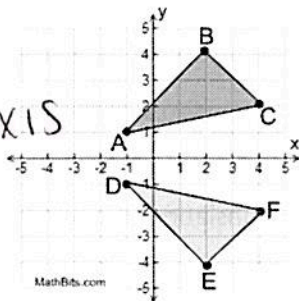


15. Using the information given below, which set of triangles can not be proven similar?



16. Which rigid motion will verify that $\triangle ABC$ is congruent to $\triangle DEF$ as shown at the below?

A reflection over the x-axis



17.

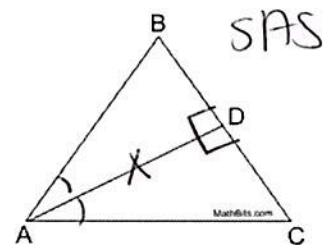
Given: \overline{AD} bisects $\angle BAC$

$\overline{AD} \perp \overline{BC}$

Prove: $\triangle ADB \cong \triangle ADC$

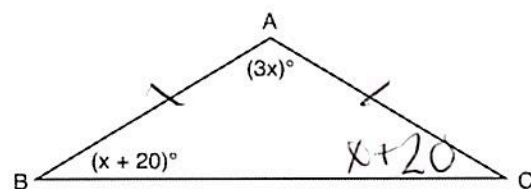
How would you prove that the triangles are congruent?

- ① Side-Angle-Side (SAS)
- [2] Angle-Side-Angle (ASA)
- [3] Side-Side-Side (SSS)
- [4] Angle-Angle-Side (AAS)



18. In the diagram below of $\triangle ABC$, $\overline{AB} \cong \overline{AC}$, $m\angle A = 3x$, and $m\angle B = x + 20$. What is the value of x ?

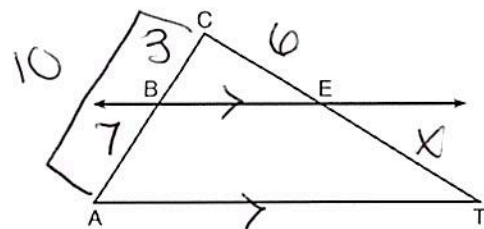
$$\begin{aligned} x+20 + x+20 + 3x &= 180 \\ 5x + 40 &= 180 \\ 5x &= 140 \\ \boxed{x = 28} \end{aligned}$$



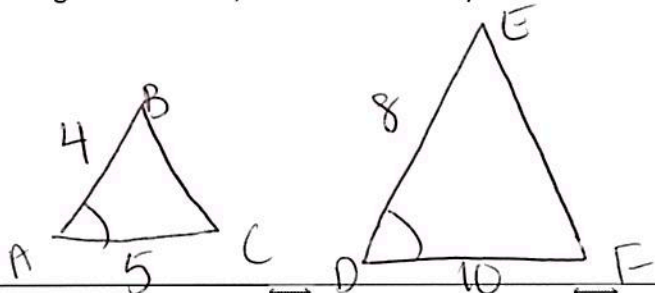
Isosceles \triangle !

19. In the diagram below of $\triangle ACT$, $\overleftrightarrow{BE} \parallel \overleftrightarrow{AT}$. If $CB = 3$, $CA = 10$, and $CE = 6$, what is the length of \overline{ET} ?

$$\begin{aligned} \frac{3}{7} &= \frac{6}{x} \\ 42 &= 3x \\ \boxed{x = 14} \end{aligned}$$



20. In triangles ABC and DEF , $AB = 4$, $AC = 5$, $DE = 8$, $DF = 10$, and $\angle A \cong \angle D$. Is $\triangle ABC \sim \triangle DEF$? Explain your answer. If the triangles are similar, write the similarity statement.

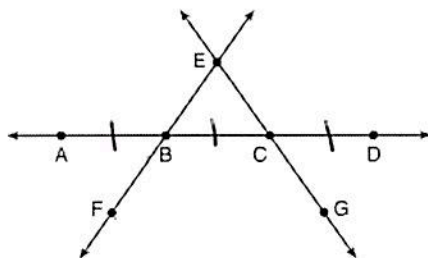


$$\begin{array}{l|l} S & \frac{4}{8} = \frac{1}{2} \\ A & \angle A \cong \angle D \\ S & \frac{5}{10} = \frac{1}{2} \end{array}$$

Yes $\triangle ABC \sim \triangle DEF$ by SAS \sim

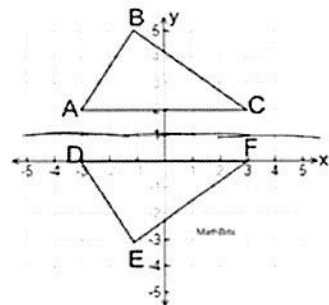
21. In the diagram below, \overleftrightarrow{FE} bisects \overline{AC} at B , and \overleftrightarrow{GE} bisects \overline{BD} at C . Which statement is always true?

- (1) $\overline{AB} \cong \overline{DC}$
 (2) $\overline{FB} \cong \overline{EC}$
 (3) \overleftrightarrow{BD} bisects \overleftrightarrow{GE} at C .
 (4) \overleftrightarrow{AC} bisects \overleftrightarrow{FE} at B .

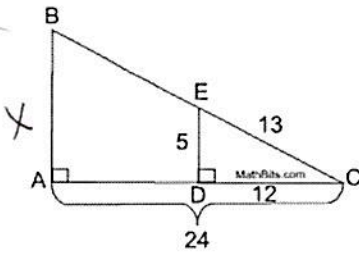


22. Which rigid transformation will verify that $\triangle ABC$ is congruent to $\triangle DEF$, as shown below?

- [1] reflection in the y -axis
 [2] reflection in the x -axis
 (3) reflection in the line $y = 1$
 [4] translation of down two units



23. Given: $\triangle ABC \sim \triangle DEC$, determine AB.



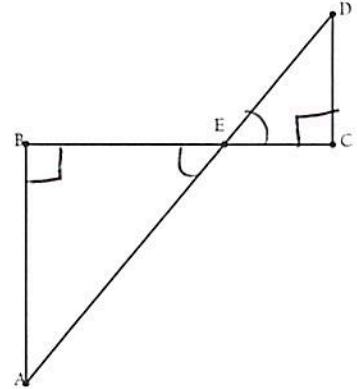
$$\frac{5}{12} = \frac{x}{24}$$

$$120 = 12x$$

$$x = 10$$

24. Given: $\overline{DC} \perp \overline{BC}$, $\overline{AB} \perp \overline{BC}$
Prove: $\triangle ABE \sim \triangle DCE$

AA!



STATEMENT

REASON

① $\overline{DC} \perp \overline{BC}$, $\overline{AB} \perp \overline{BC}$

① Given

② $\angle B \cong \angle C$

② \perp lines form \cong right \angle 's

③ $\angle BEA \cong \angle CED$

③ vertical \angle 's are \cong

④ $\triangle ABE \sim \triangle DCE$

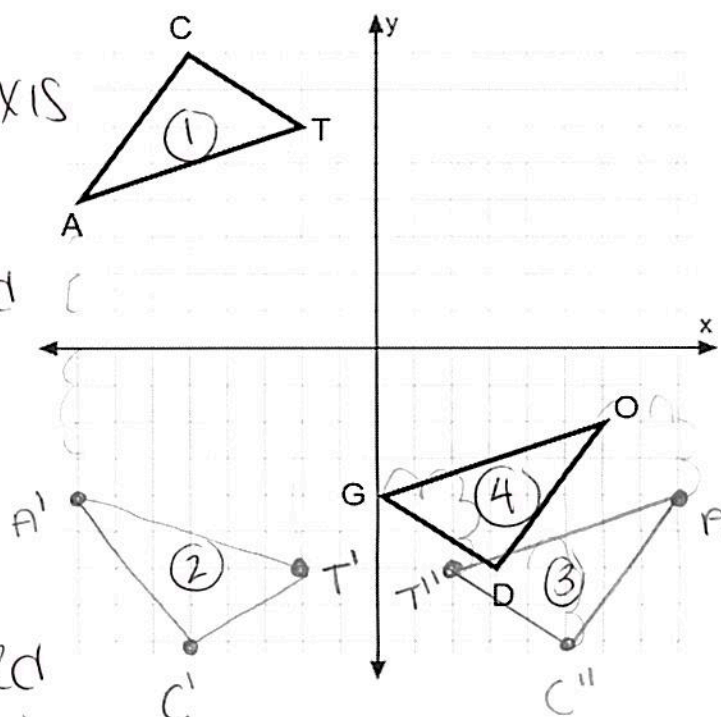
④ AA \cong AA

25. $\triangle CAT$ and its image $\triangle DOG$, are graphed on the set of axes shown. Describe a single transformation, or sequence of transformations that map $\triangle CAT$ onto $\triangle DOG$.

a reflection over the x-axis
followed by a reflection
over the y-axis followed
by a translation of up 2
units, left 2 units

OR

a rotation of 180° followed
by a translation of up 2 units,
left 2 units



26. $\triangle ABC$ and its image $\triangle PQR$, are graphed on the set of axes shown. Describe a single transformation, or sequence of transformations that map $\triangle ABC$ onto $\triangle PQR$.

a reflection over the
y-axis followed by a
translation down 4 units

