

CP Geometry Quarter 2 Exam

Geometric Relationships and Properties, Similarity

Name: _____

Block: _____

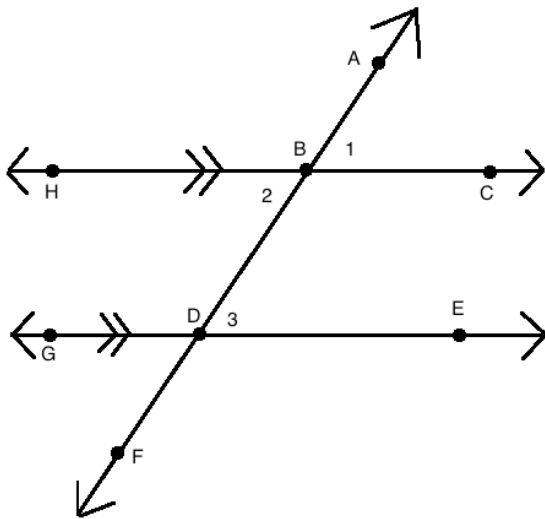
Date: _____

Section	Points Earned	Points Possible
I		60
II		20
III		20
Total		100

I. Multiple Choice – 3 points each

Identify the letter of the choice that best completes the statement or answers the question.

1. The following proof proves that corresponding angles are congruent ($\angle 1 \cong \angle 3$). Fill in the missing step.

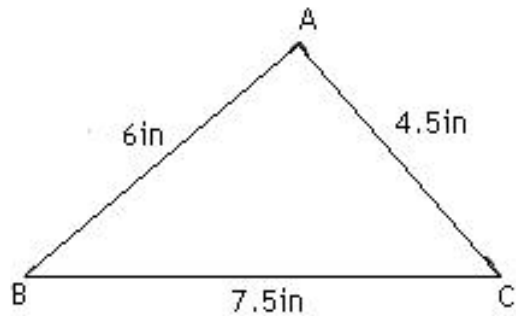
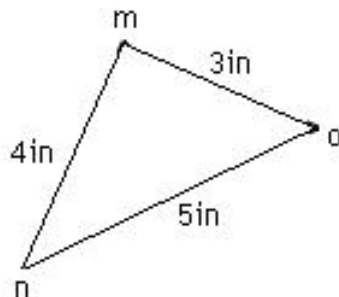


STATEMENT	REASON
$\overline{HC} \parallel \overline{GE}$	Given
$\angle 1 \cong \angle 2$	Vertical Angles are congruent
$\angle 2 \cong \angle 3$	Alternate Interior Angles are congruent
$\angle 1 \cong \angle 3$?

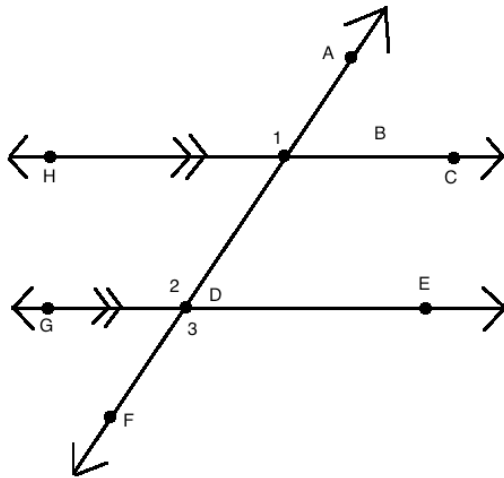
- (A) Reflexive Property
- (B) Transitive Property
- (C) Distributive Property
- (D) Symmetric Property

2. Find the scale factor from the small triangle to the large triangle in the two similar triangles below.

- (A) 2
- (B) 1.5
- (C) .67
- (D) 3



3. The following proves Alternate Exterior Angles are congruent ($\angle 1 \cong \angle 3$) Fill in the missing part of the proof.

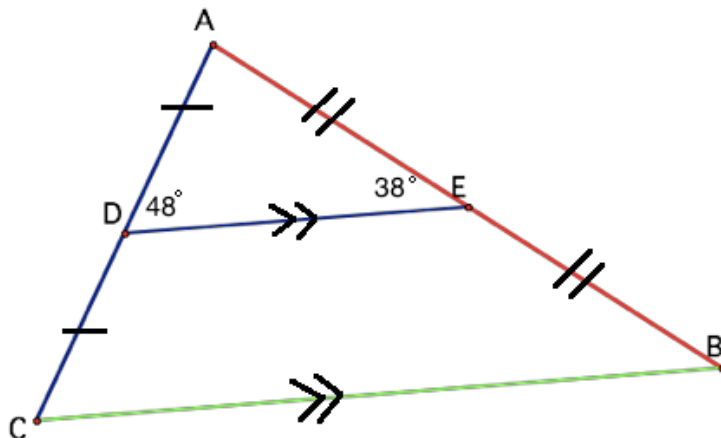


STATEMENT	REASON
$\overleftrightarrow{HC} \parallel \overleftrightarrow{GE}$	Given
$\angle 1 \cong \angle 2$?
$\angle 2 \cong \angle 3$	Vertical Angles are congruent
$\angle 1 \cong \angle 3$	Transitive Property

- (A) Alternate Exterior Angles are congruent
- (B) Alternate Interior Angles are congruent
- (C) Same Side Interior Angles are congruent
- (D) Corresponding Angles are congruent

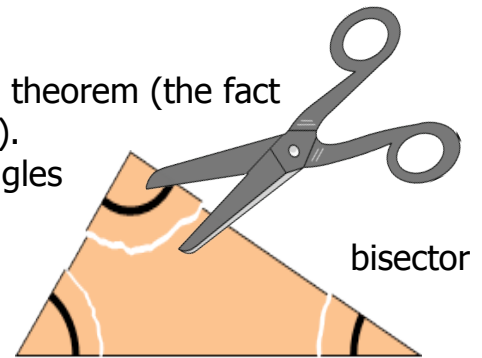
4. The midsegment theorem states that: A midsegment connecting two sides of a triangle is parallel to the third side and is half as long. Given the length of \overline{DE} is 6 cm, find the length of \overline{CB} .

- (A) $m\angle B = 38^\circ$ and the length of \overline{CB} is 12cm
- (B) $m\angle B = 48^\circ$ and the length of \overline{CB} is 12cm
- (C) $m\angle B = 38^\circ$ and the length of \overline{CB} is 3cm
- (D) $m\angle B = 48^\circ$ and the length of \overline{CB} is 3cm



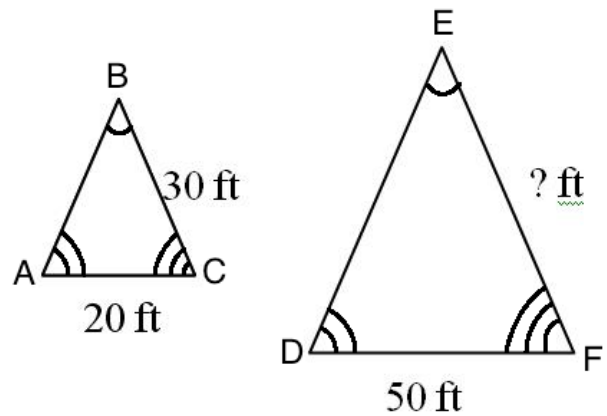
5. What does the following picture represent?

- (A) An informal way to prove the triangle sum theorem (the fact that three angles in a triangle sum to 180°).
- (B) An informal way to prove that the base angles of an isosceles triangle are congruent.
- (C) An informal proof of the perpendicular theorem.
- (D) An informal proof of the vertical angles theorem.



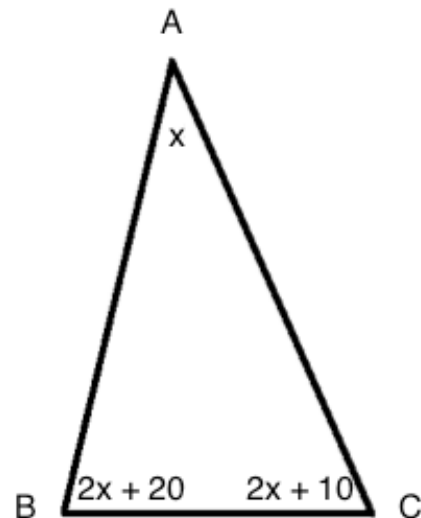
6. In this image, $\triangle ABC \sim \triangle DEF$. Find the missing side length.

- (A) 12 ft
- (B) 75 ft
- (C) 33.3 ft
- (D) 60 ft



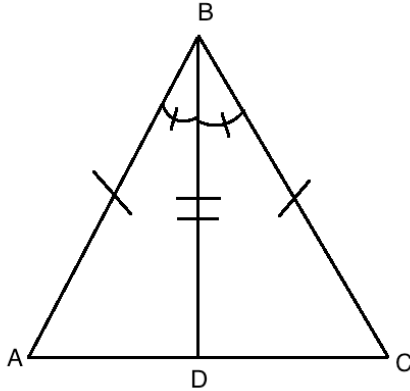
7. Find x and $\angle B$ in the triangle below.

- (A) $x = 30$, $m\angle B = 80^\circ$
- (B) $x = 37.5$, $m\angle B = 95^\circ$
- (C) $x = 80$, $m\angle B = 180^\circ$
- (D) $x = 25.5$, $m\angle B = 71^\circ$



8. Find the missing step in the proof below.

Prove: $\angle A \cong \angle C$

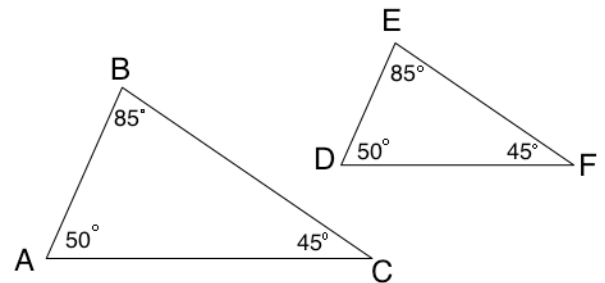


STATEMENT	REASON
$\overline{BC} \cong \overline{BA}$	Given
$\angle ABD \cong \angle CBD$	Given
$\overline{BD} \cong \overline{BD}$	Reflexive Property
?	?
$\angle A \cong \angle C$	CPCTC

- (A) Statement: $\triangle ABD \cong \triangle CBD$, Reason: SAA
 (B) Statement: $\triangle ABD \cong \triangle CBD$, Reason: SSA
 (C) Statement: $\triangle ABD \cong \triangle CBD$, Reason: ASA
 (D) Statement: $\triangle ABD \cong \triangle CBD$, Reason: SAS

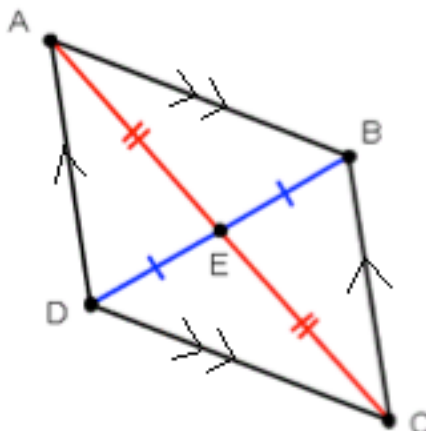
9. Which statement below is TRUE given the picture below.

- (A) These two triangles are similar by the AA Similarity Theorem.
 (B) These two triangles are congruent by the AA Congruency theorem.
 (C) These two triangles are congruent by the SSS congruency theorem.
 (D) These two triangles are similar by the SSS similarity theorem.



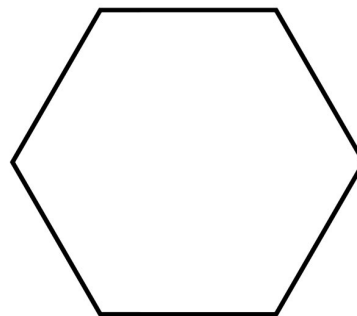
10. Diagonals in a parallelogram bisect each other.
 Find x if $DE = 3x - 2$ and $EB = x + 6$.

- (A) $x = 4$
- (B) $x = 46$
- (C) $x = 8$
- (D) $x = 10$



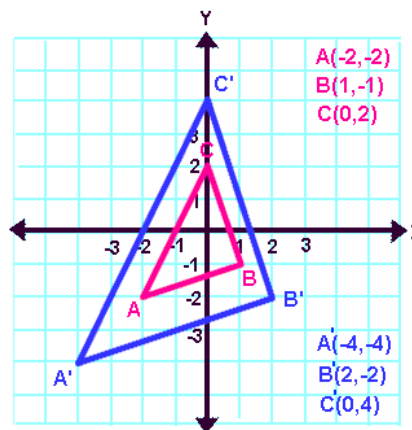
11. Find the sum of exterior angles in this polygon below.

- (A) 360°
- (B) 60°
- (C) 720°
- (D) 120°



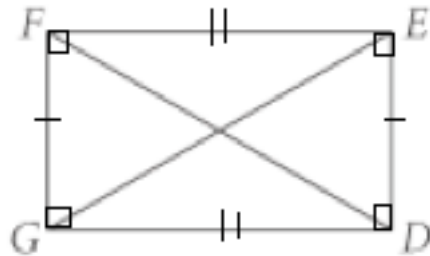
12. Given the dilation picture below, find the scale factor of the similar triangles.

- (A) 2
- (B) $\frac{1}{4}$
- (C) 4
- (D) $\frac{1}{2}$



13. Given $FD = 2y + 4$ and $GE = 5y - 5$, find the length of a diagonal.

- (A) 25.8 units
- (B) 10 units
- (C) 3 units
- (D) 5 units

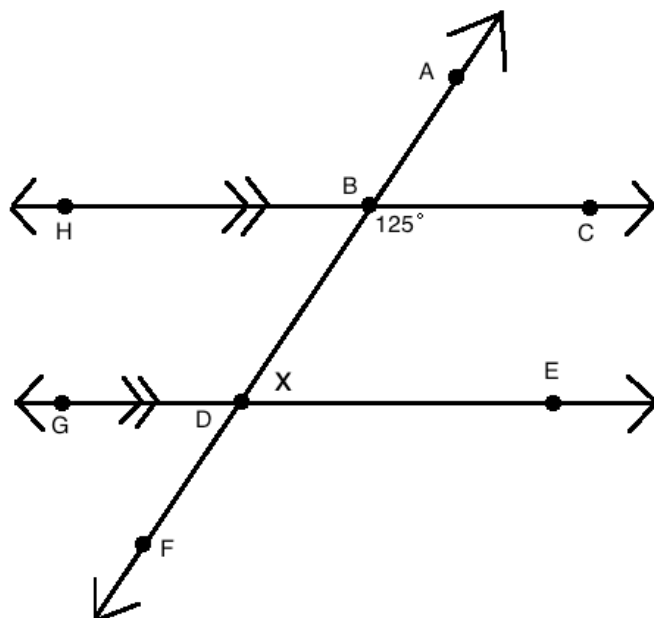


14. Which of the following is **NOT TRUE** about similar figures?

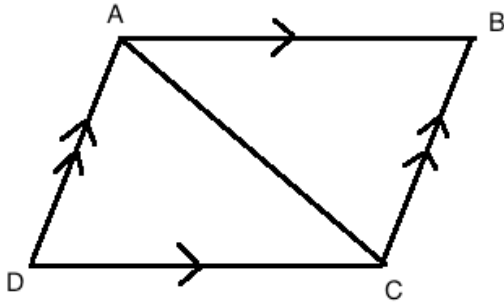
- (A) Corresponding sides are congruent in similar figures.
- (B) Corresponding angles are congruent in similar figures.
- (C) Corresponding sides are proportional in similar figures.
- (D) There is a scale factor relating the sides of similar figures.

15. Find x in the transversal picture below.

- (A) $x = 125^\circ$
- (B) $x = 55^\circ$
- (C) $x = 180^\circ$
- (D) $x = 30^\circ$



16. What does the following proof prove?

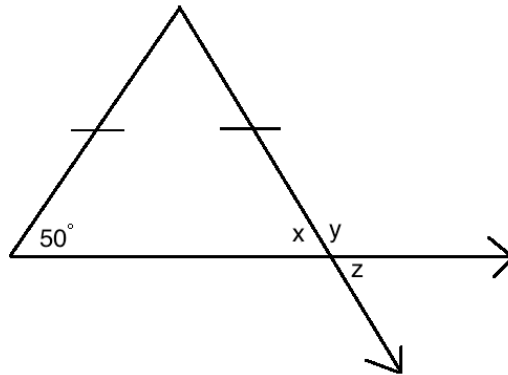


STATEMENT	REASON
Quadrilateral ABCD is a parallelogram	Given
$\overline{AD} \cong \overline{BC}$	Opposite sides of parallelograms are congruent.
$\overline{AB} \cong \overline{DC}$	Opposite sides of parallelograms are congruent.
$\overline{AC} \cong \overline{AC}$	Reflexive Property
$\triangle ADC \cong \triangle CBA$	SSS
$\angle D \cong \angle B$	CPCTC

- (A) Diagonals in a parallelogram are congruent.
- (B) Opposite sides in a parallelogram are congruent.
- (C) Opposite sides in a parallelogram are parallel.
- (D) Opposite angles in a parallelogram are congruent.

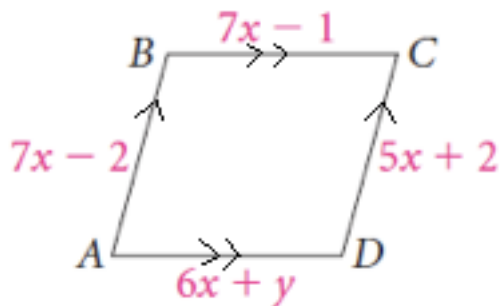
17. Find the missing angles in the picture below.

- (A) $x = 60^\circ, y = 60^\circ, z = 60^\circ$
- (B) $x = 50^\circ, y = 140^\circ, z = 40^\circ$
- (C) $x = 30^\circ, y = 150^\circ, z = 30^\circ$
- (D) $x = 50^\circ, y = 130^\circ, z = 50^\circ$



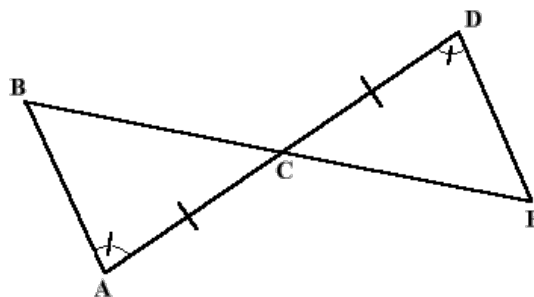
18. Opposite sides in a parallelogram are congruent. Solve for x .

- (A) $x = 2$
- (B) $x = 10$
- (C) $x = 1$
- (D) $x = 12$



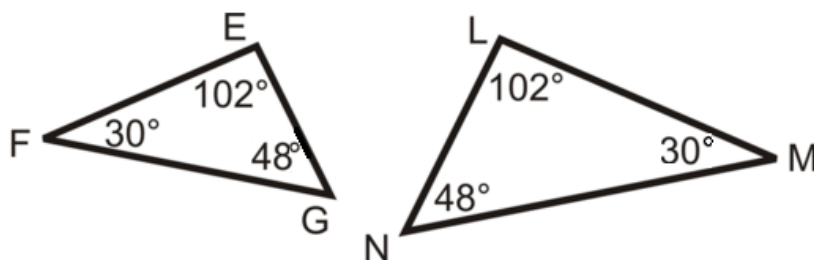
19. How would you prove $\triangle ACB \cong \triangle DCE$?

- (A) Vertical Angles, SAS
- (B) Vertical Angles, ASA
- (C) Reflexive Property, SAS
- (D) Reflexive Property, ASA



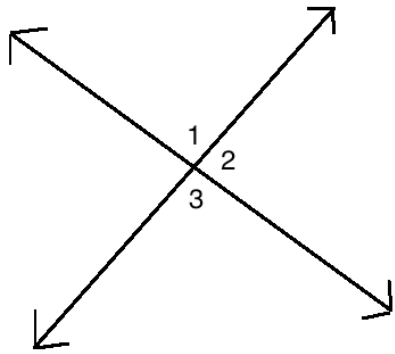
20. Which two triangles are similar?

- (A) $\triangle FEG \sim \triangle NLM$
- (B) $\triangle FEG \sim \triangle MLN$
- (C) $\triangle FEG \sim \triangle NML$
- (D) $\triangle FEG \sim \triangle LMN$



II. Short Answer 20 points total

21.) The following proof proves that vertical angles are congruent. Fill in the missing reasons (4 points)



STATEMENT	REASON
$\angle 1 + \angle 2 = 180^\circ$	
$\angle 2 + \angle 3 = 180^\circ$	
$\angle 1 + \angle 2 = \angle 2 + \angle 3$	
$\angle 1 = \angle 3$	

22.) Match the figures with the correct theorem (6 points)

1.

2.

3.

4.

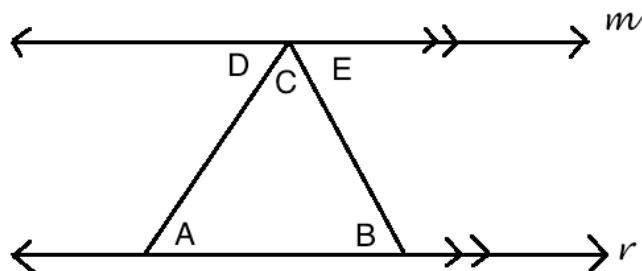
5.

6.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

- A. SSS Similarity Theorem
- B. SSS Congruence Theorem
- C. SAS Similarity Theorem
- D. SAS Congruence Theorem
- E. AA Similarity Theorem
- F. AAS Congruence Theorem

23.) Fill in the missing steps of Triangle Sum Proof (5 points)



STATEMENT	REASON
line $m \parallel$ line r	
$\angle A \cong \angle D$	
$\angle B \cong \angle E$	
$\angle D + \angle C + \angle E = 180^\circ$	
$\angle A + \angle B + \angle C = 180^\circ$	

24.) Using your knowledge of quadrilateral properties, find the missing angles and sides in the figures below. (5 points)

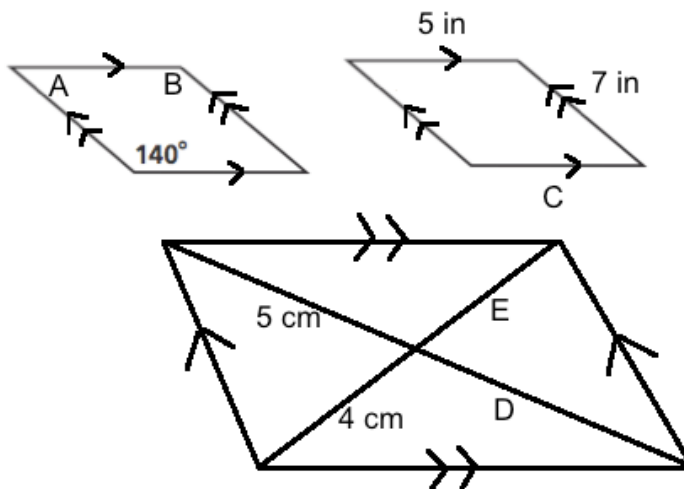
A = _____

B = _____

C = _____

D = _____

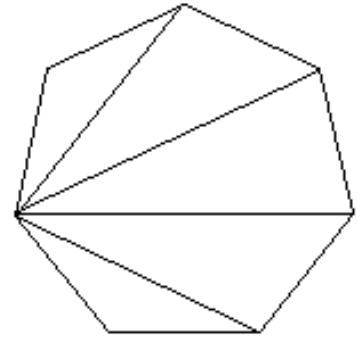
E = _____



III. Open Response – 20 points total, 10 points each

25.) Use the picture below to answer questions a-e

- a) If n represents the number of sides in a regular polygon, which expression represents the number of triangles in that polygon? Use the picture to the right to help you. Circle the correct answer.



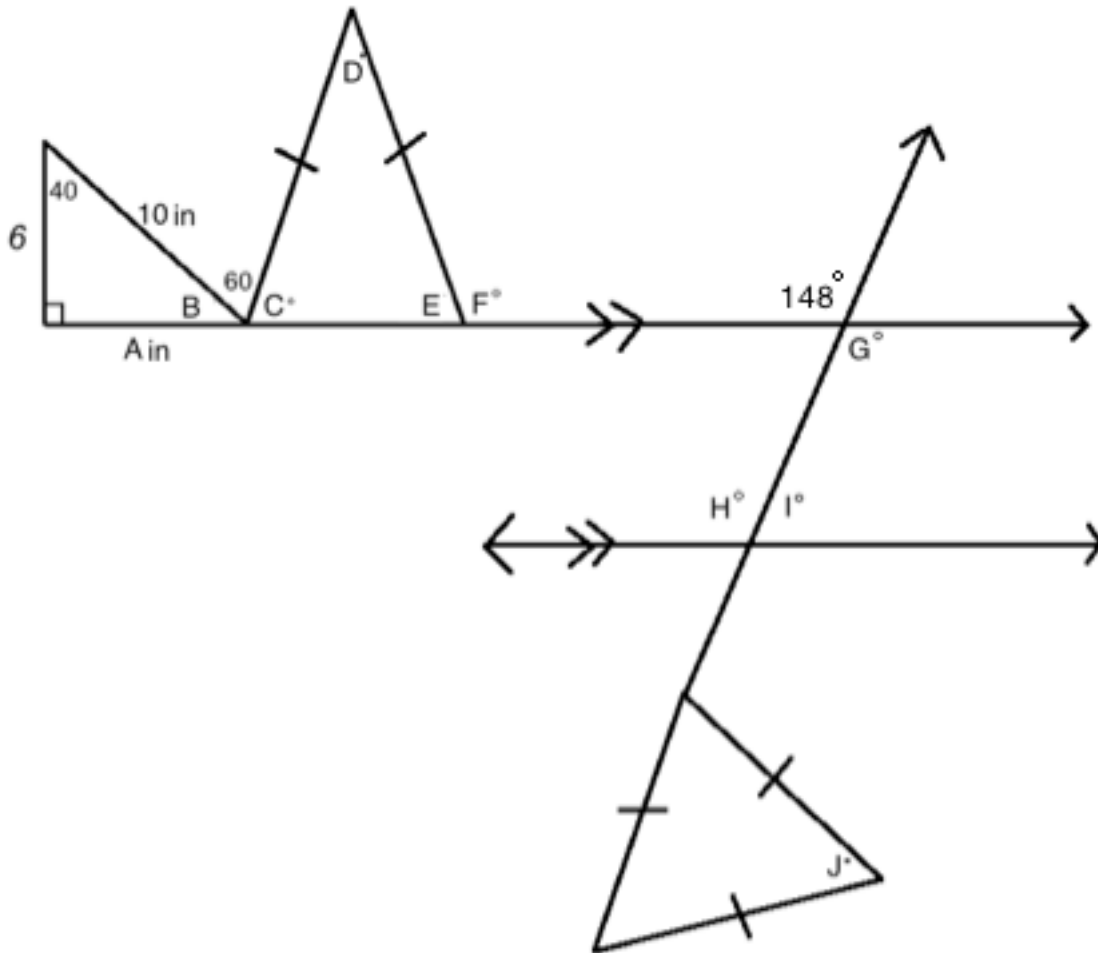
Option 1: $(n-3)$

Option 2: $(n-4)$

Option 3: $(n-2)$

- b) There are three angles in a triangle. How many degrees do these three angles always sum to?
- c) Given your answers to a and b, write the formula for the sum of interior angles in a polygon.
- d) Using your answer to part c, find the sum of interior angles in the polygon pictured above.
- e) Assume the same polygon above is regular. Find the measure of one interior angle in this polygon.

26.) Use knowledge of Pythagorean theorem, transversals, triangles, vertical angles, isosceles triangles, and linear angles to find the missing sides and angles.



A = _____ B = _____ C = _____ D = _____ E = _____

F = _____ G = _____ H = _____ I = _____ J = _____