*Instructions:* Please show your work in the space provided. You must show your work to receive full credit. This quiz is closed book, closed notes, and calculators are NOT allowed. Simplify your answers, leave your answers in exact arithmetic (i.e., no decimal approximations), and be sure to include units where appropriate. ***NOTE:*** The symbol for arc is: ⌢

1. (6 pts) Given that lines m and n intersect, $m\angle 1 = 7x - 21$, and $m\angle 3 = 3x + 7$, find each of the following.

(a) $m\angle 1 =$ _____

(b) $m\angle 4 =$ _____
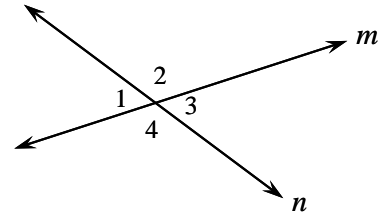
2. (6 pts) If $m\angle A = 2x + 3$, $m\angle B = 2x - 6$, and $\angle A$ and $\angle B$ are supplementary, find each of the following.
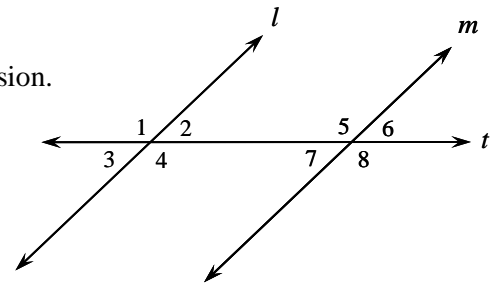
(a) $m\angle A =$ _____

(b) $m\angle B =$ _____

3. (8 pts) Based on the given information in each of the following,
          can you conclude that $l \parallel m$? State the reason, if any, for your conclusion.

(a) $m\angle 1 = 108°$ and $m\angle 7 = 72°$
Circle one: **Yes** or **No**
Why:
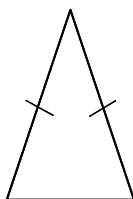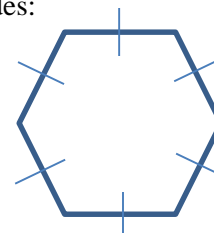
(b) $m\angle 4 = 112°$ and $m\angle 2 = 68°$
Circle one: **Yes** or **No**
Why:

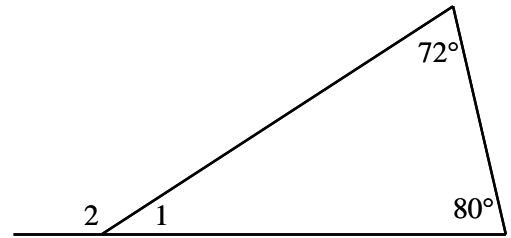4. (6 pts) Classify the given polygon by the measure of its angles *and* length of sides:

(a)

_____ _____

(b)

_____ _____

5. (6 pts) Given the figure to the right, find each of the following.
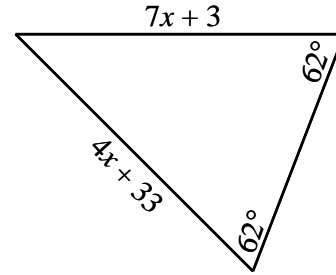
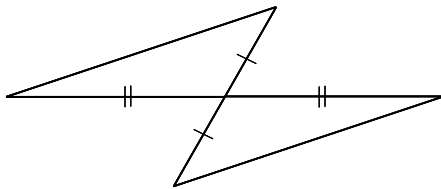   (a) m∠1 = _____

      (b) m∠2 = _____

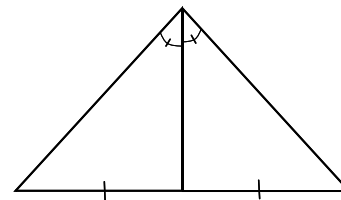6. (4 pts) Given the figure below, find x.

$x =$ _____

7. (8 pts) Circle YES or No if the triangles can be proved congruent? If Yes, show by how you know which method (i.e., SSS, SAS, etc.) confirms your assertion.
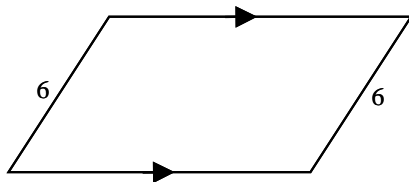
(a)   **Yes** or **No**

Why?:

(b) **Yes** or **No**

Why?:
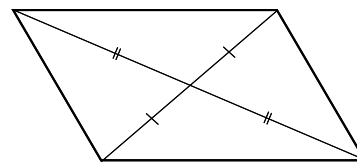
8. (8 pts) Circle YES or No if the given quadrilateral a parallelogram? Explain the reason for your conclusion.

(a)   **Yes** or **No**

Why?:

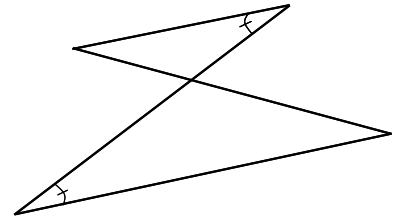(b) **Yes** or **No**

Why?:

9. (4 pts)   Suppose Δ*ABC* is an isosceles right triangle with a leg of length 7 ft, and vertex angle of 10°, find the length of :.

The altitude: _____ ___Hypotenuse = _____ ___,   Measure of each angle: _____
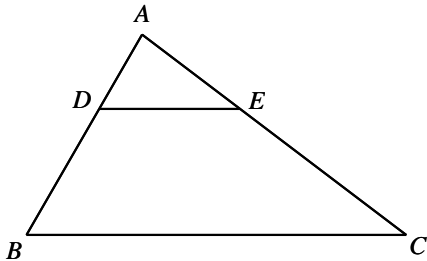
10. (4 pts)   Are the triangles similar? If so, by which method (SAS~, SSS~, or AA~)?
Circle one
YES or **NO**

Why?:

11. (6 pts) Given $\triangle ABC$, $\overline{DE} \parallel \overline{BC}$, $AD = 4$, $DB = 6$, and $AC = 15$, find EC. All dimensions in yards.

EC = _____

12. (3 pts ea) Find each of the following using the given information.

    (a) If $\angle AEB = 60°$, then $m\angle AFB = $ _____°

    (b) If $m\widehat{EA} = 110°\ and\ m\widehat{FB} = 150°$
       then $m\angle AHE = $ _____°

    (c) If $m\widehat{AB} = 185°\ and\ \angle EGF = 60°\ then\ m\widehat{EF} = $_____°

    (d) If $m\widehat{AB} = 82°\ and\ m\widehat{EF} = 30°$ then $m\angle EHA = $ _____°

    (e) If AH = 6, BH =4 , EH = 2 then FH = _____.

    (f) If GE = 2, GB = 4, AG = 6, then GF = _____.

    (g) If $\angle EGF = 26°\ \ and\ \angle AHB = 62°\ then\ m\widehat{EF} = $_____° & $m\widehat{AB} = $_____°

   (h) If $m\widehat{AB} = 45°$ then find the length of its minor arc, S from A to B, if the radius is 4'.
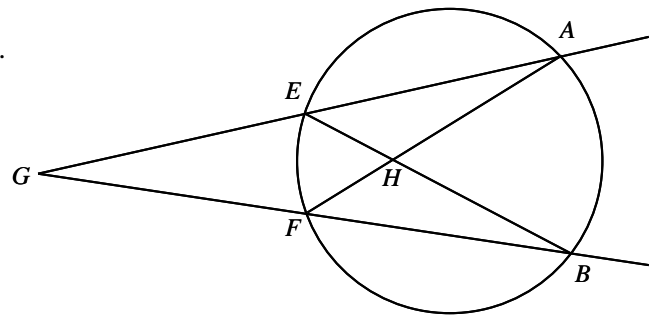
13. (3 pts) If A= the set of all rhombi and B = the set of all rectangles, then is **A⊆B**, **B⊆A**, or is it **neither**? (circle one)
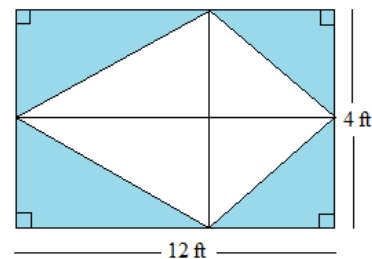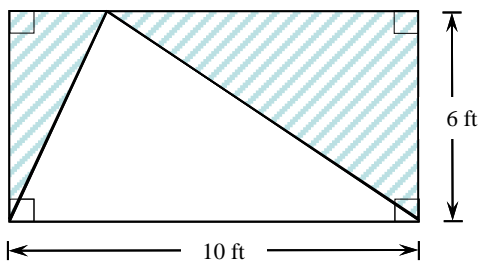
14. (7 points) Complete the unshaded portion of the following table and leave all answers in exact fractional form (**no decimals!**):

Degrees	$\theta = 30°$	$\theta = 60°$		$\theta = 330°$
Radians			$\dfrac{\pi}{4}$	
$Sin(\theta)$				

15. (6 pts) Find the area of the quadrilateral.
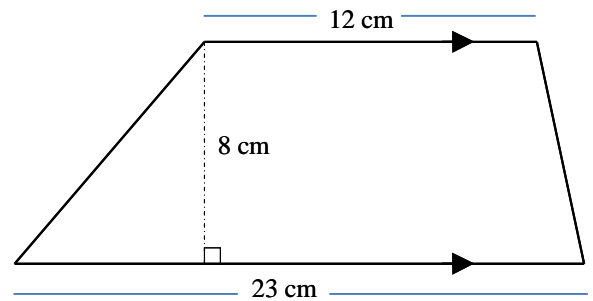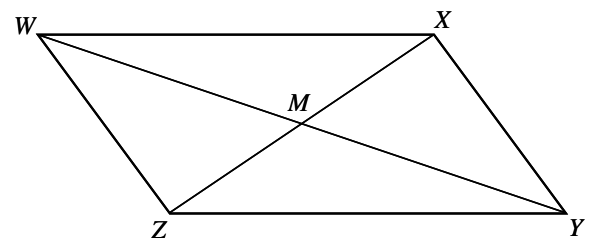

16. (6 points) Find the area of the shaded region. Place your answer in the non-shaded region and include the correct untis.

17. (8 pts) *Given*: Parallelogram *WXYZ*, with diagonals $\overline{WY}$ and $\overline{XZ}$

          Prove: $\Delta WMZ \cong \Delta YMX$

PROOF

| Statements	Reasons

Other proofs:
a) WXYZ is a rhombus. Prove its diagonals are perpendicular.
b) Prove the median of an isosceles triangle is an altitude.
c) Prove that if two chords intersect in the interior of a circle the angle formed will be ½ the sum of the intersected arcs.
d) Prove the converse of postulate 11.
e) Prove the diagonals of a kite are perpendicular.

18. (6 points) Find the area *and* perimeter of regular hexagon with each side of length 12 in.

- Find the area of a circle inscribed in a square with side lengths of 12 in.
- Find the area of a circle circumscribed about a regular pentagon with side lengths of 12 in. (requires you to use sine or cosine).
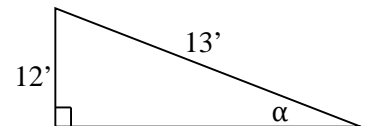- Find the area of a circle inscribed in a regular hexagon with side lengths of 12 in.

Area = _____ _____

19. (3 pts) Consider the picture of the circle below with tangent lines forming an angle exterior to the circle of 60⬜ Find the diameter of the circle.

45 ft

60°

45 ft
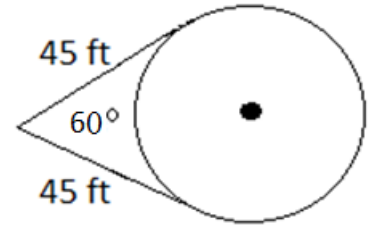
20. (3 pts) If arc $\overset{\frown}{DB}$ is 90°, $\overline{AB}$ & $\overline{AD}$ are tangent lines, then what is the best description of the quadrilateral formed by points ABCD?

B

•C

A

D
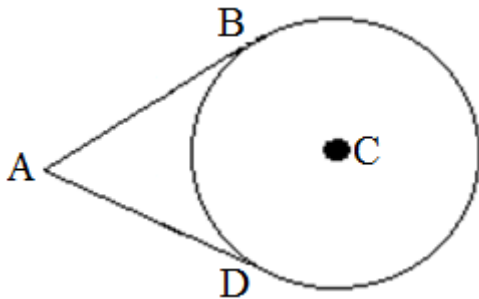
21. (7 points) For the right triangle determine the six trigonometric ratios of angle α.

13'

12'

α

$Sin(\alpha) =$ _____ $Csc(\alpha) =$ _____

$Cos(\alpha) =$ _____ $Sec(\alpha) =$ _____

$Tan(\alpha) =$ _____ $Cot(\alpha) =$ _____ $\alpha =$ _____⬜

22.   (4 pts) Find the lateral area of a regular square pyramid with base edges and slant height of length 4.

23. (8 pts) Using only a compass and straightedge, complete each of the following constructions.
        If you are unable to complete any of the constructions but have ideas on how one might continue,
        be sure to write your thoughts down for possible partial credit.

(Do one of the following constructions)
        (a) Through point *A*, construct the line that is perpendicular to line *m* , (b) then bisect this angle to make two
        45° angles and label each angle.
        (b) Given a circle, construct its center, then construct a line perpendicular to a radius.
        (c) Construct a 30-60-90 triangle and a 45-45-90 triangle.
        (d) Construct a square, then inscribe a circle in it.

A•

← ———————————————→ *m*

24. Prove by contradiction that "If a quadrilateral is a square, then it is a rhombus!"

> Also by contradiction,
> - Prove a right triangle cannot have 2 right angles.
> - Prove the converse of postulate 11.
> - Prove if a rectangle does not have congruent sides then it is not a square.
> - Prove that there is not one integer where that integer is the largest.