

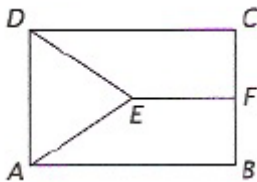
DIRECTIONS: You may use a calculator, compass, straight edge, protractor, and pencil only. No book or notes allowed. Where work is to be shown you will receive no credit without sufficient work to justify your answer. Where units are required you will lose points for failure to include them or for using incorrect units.

Please write legibly and ensure your upload is dark enough to be read when graded. Please upload as a .pdf and ensure all pages are upright and included in a single document. All work is to be completed on this document. Nothing else will be graded.

1. Read the following statements carefully and mark them "T" (true) or "F" (false)

- | | |
|---|----------|
| a. A line segment has exactly one midpoint. | a. _____ |
| b. If two lines intersect, they form two pairs of vertical angles. | b. _____ |
| c. Two lines that do not intersect must be parallel. | c. _____ |
| d. If two angles are supplementary, then they are necessarily a linear pair. | d. _____ |
| e. The sides of one of two vertical angles are opposite rays to the sides of the other. | e. _____ |

2. This figure shows the design of the flag of Czechoslovakia.



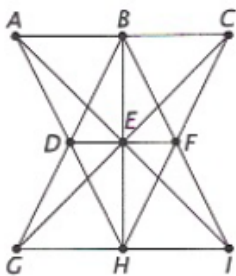
What type of angle does each of the following angles appear to be?

- | | |
|-----------------|----------|
| a. $\angle AEF$ | a. _____ |
| b. $\angle AED$ | b. _____ |
| c. $\angle EFC$ | c. _____ |

Name a pair of angles with a common vertex in the figure that appear to be

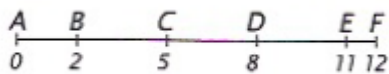
- | | |
|-------------------|----------|
| d. complementary. | d. _____ |
| e. a linear pair. | e. _____ |

3. Write the equation that follows from each of the following statements about the figure.



- | | |
|---|----------|
| a. $B \cdot F \cdot I$ | a. _____ |
| b. HB bisects $\angle AHC$. | b. _____ |
| c. E is the midpoint of GC. | c. _____ |
| d. $\angle AEB$ and $\angle IEH$ are vertical angles. | d. _____ |

4. This one-foot ruler can be used to measure every whole-number distance from 1 to 12 inches.



Fill in the numbered blanks on the Ruler Postulate. Put your answers in the box at the right →

a. The (1) on a line can be numbered so that positive number (2) measure (3).

(a1) _____

(a2) _____

(a3) _____

b. Of what segment on this ruler is C the midpoint?

b. _____

c. Is point D on this ruler between points C and F?

c. _____

d. Explain why or why not. d. _____

Name a pair of points that can be used to measure each of the following distances.

e. 4

e. _____

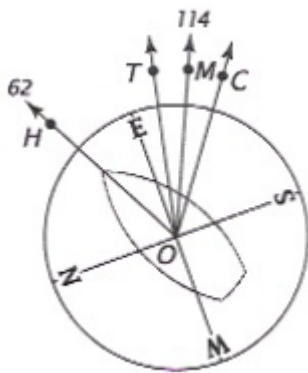
f. 6

f. _____

g. 9

g. _____

5. This figure shows a circular protractor used in navigation. The coordinates of OH and OM are 62 and 114 respectively.



a. Find the measure of $\angle HOM$.

a. _____

b. Find the coordinate of OT given that $\angle HOT = 40^\circ$.

b. _____

c. Find the measure of $\angle TOM$.

c. _____

d. Find the measure of $\angle TOC$, given that OM bisects $\angle TOC$.

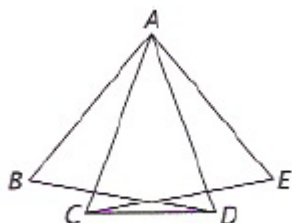
d. _____

e. Find the coordinate of OC.

e. _____

6. From the list below the figure, give the letter of the reason that supports each of the following statements, all of which are true. If none of them do, write "N". (You will not use all of the reasons. However, neither will you use any of them more than once.)

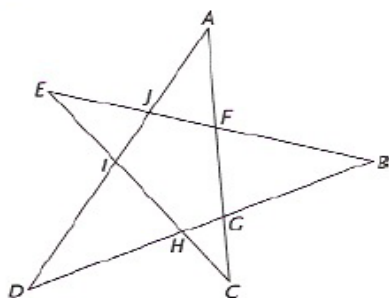
In this figure, $AB=AC=AD=AE=BD=CE$.



- A. A triangle is equilateral iff all of its sides are equal.
- B. If two sides of a triangle are equal, the angles opposite them are equal.
- C. Corresponding parts of congruent triangles are equal.
- D. The angles of a linear pair are supplementary.
- E. An equilateral triangle is also equiangular
- F. A triangle is scalene iff no sides are equal.
- G. SSS

- | | |
|---|----------|
| a. $\triangle ABD \cong \triangle AEC$ | a. _____ |
| b. $\angle B = \angle E$ | b. _____ |
| c. $\triangle ABD$ and $\triangle AEC$ are equilateral. | c. _____ |
| d. $\triangle ABD$ and $\triangle AEC$ are equiangular. | d. _____ |
| e. $\triangle ACD$ is isosceles. | e. _____ |
| f. $\angle ACD = \angle ADC$ | f. _____ |

7. The 5 line segments that form this star meet at their endpoints so that $\angle A = \angle B = \angle C = \angle D = \angle E$.



- | | |
|---|-------------------|
| a. What can you conclude about AG and GD? | a. _____ |
| b. Why? | b. _____
_____ |

8 . Distance formula problems:

- a. Write the formula for the distance between two points $P_1 (x_1, y_1)$ and $P_2 (x_2, y_2)$

a. $d =$ _____

GIVEN: Points A(2, 0), B(5, 4), and C(-3, 2) are connected to form $\triangle ABC$.

Use the formula to find the EXACT distances. Simplify all radicals as much as possible. MUST clearly and legibly show which coordinates go in each part of the distance formula before solving to receive ANY credit

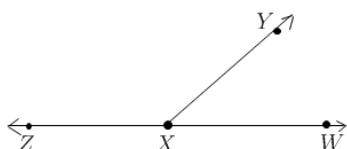
b. $AB =$ _____ EXACT Distance: _____

c. $BC =$ _____ EXACT Distance: _____

d. $AC =$ _____ EXACT Distance: _____

e. What kind of triangle is $\triangle ABC$? _____

9. In the figure below, XZ and XW are opposite rays. $\angle YXZ = (3x + 8)^\circ$ and $\angle YXW = (2x - 3)^\circ$



Find each of the following numbers. Must clearly show work to receive any credit.

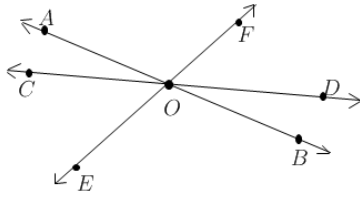
a. $x =$ _____

b. $\angle YXZ =$ _____

c. $\angle YXW =$ _____

Solve for x	Solve for $\angle YXZ$	Solve for $\angle YXW$

10. In the figure below, lines AB, CD, and EF are concurrent at point O. $\angle AOC = (12x - 9)^\circ$ and $\angle DOB = (2x + 21)^\circ$



Find each of the following numbers. Clearly show work for credit.

a. $x =$ _____

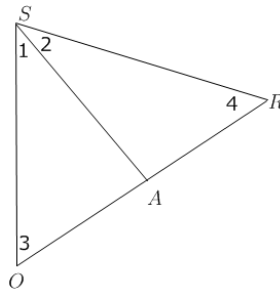
b. $\angle AOC =$ _____

c. $\angle DOB =$ _____

d. If $\angle AOF = 100^\circ$, what is the measure of $\angle COE$? _____

Solve for x	Solve for $\angle AOC$	Solve for $\angle DOB$	Solve for $\angle COE$

11. Supply the reasons for the following proof. Write legibly. Unreadable work will be counted wrong.



Given: SA bisects $\angle OSR$; $\angle 3 = \angle 4$

Prove: A is the midpoint of OR

Statements

Reasons

1. SA bisects $\angle OSR$; $\angle 3 = \angle 4$

1. _____

2. $\angle 1 = \angle 2$

2. _____

3. $OS = RS$

3. _____

4. $\triangle SOA \cong \triangle SRA$

4. _____

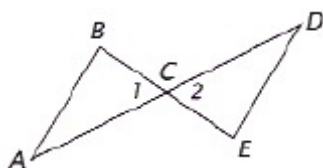
5. $OA = RA$

5. _____

6. A is the midpoint of OR

6. _____

12. Write a complete proof for the following.



Given: C is the midpoint of AD; $\angle 1$ and $\angle 2$ are vertical angles; $\angle A = \angle D$.

Prove: $AB = DE$

NOTE: The number of blanks provided exceeds the number of steps you will need. They are there for your convenience.

Statements	Reasons
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____
6. _____	6. _____
7. _____	7. _____
8. _____	8. _____
9. _____	9. _____
10. _____	10. _____