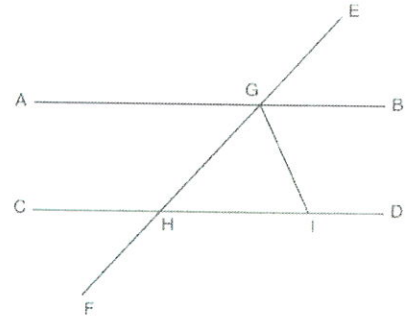


Instructions: You may use a protractor, compass, ruler and calculator for this exam. You may also use a 3x5 index card, which you will turn in with the exam along with any scrap paper provided by the testing center. It's important to show all work, and explain your reasoning. It is helpful to put a box or circle around your final answer after calculations. Give exact answers unless specifically asked to round.

1. Determine if each statement is True or False. If you mark false, explain why the statement is false, or rewrite the statement as a true one. In the figure, assume lines \overleftrightarrow{AG} and \overleftrightarrow{DI} are parallel. (1 point each)

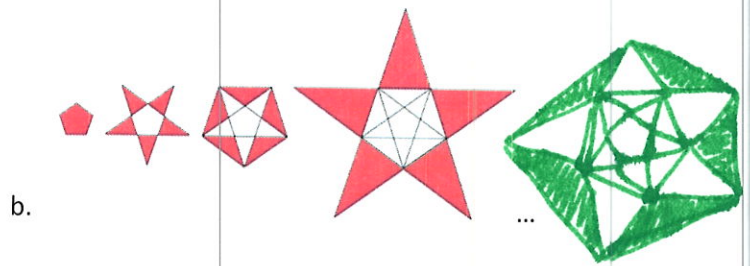


- a. T F The points A, H and D are collinear.
C, H, D are
- b. T F Another name for the line \overleftrightarrow{AB} is \overleftrightarrow{GB} .
- c. T F Angles $\angle CHG$ and angle $\angle BGE$ are supplementary.
- d. T F $\angle FHC$ and $\angle DHE$ are vertical angles.
- e. T F $\angle IGB$ and $\angle IGE$ are adjacent angles.
 $\angle IGB$ and $\angle BGE$ are
- f. T F If \overline{GH} and \overline{HI} have the same length, then $\angle IHG$ and $\angle HGI$ are congruent.
 $\angle HGI$ and $\angle GIH$ are
- g. T F If \overleftrightarrow{GB} bisects angle $\angle IGE$, then $m\angle IGB$ and $m\angle BGE$ are equal.
- h. T F $p \rightarrow q$ is logically equivalent to $q \rightarrow p$.
eq. to $\sim q \rightarrow \sim p$
- i. T F If $q \leftrightarrow \sim p$, then $\sim q \leftrightarrow p$.
- j. T F "If $m\angle FHD = m\angle HGB$, and $m\angle HGB = m\angle AGE$, then $m\angle FHD = m\angle AGE$ " is an example of the transitive property.

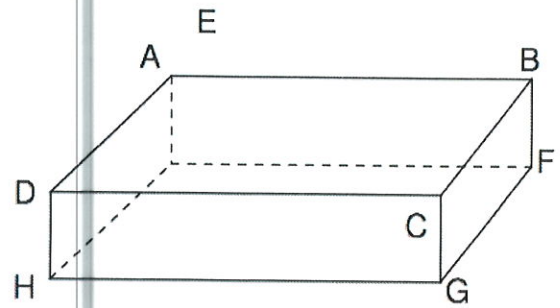
2. Look for a pattern (or two) to determine the next term or element in the sequence. (3 points each)

a. 2, 6, 18, 54, ...
x3 x3 x3

$$\begin{array}{r} 54 \\ \times 3 \\ \hline 162 \end{array}$$



3. If we determine that planes ADH and BFG are parallel, and planes ABF and DHC are parallel, and planes HGF and ADC are parallel, is that enough to conclude that the figure drawn on the right is a rectangular box (i.e. all its surfaces are rectangles)? Why or why not? Explain. (4 points)



no, because this only gives a parallelepiped (3D parallelogram). it does not guarantee all the angles are right angles

4. Suppose that $\vec{w} \parallel \vec{x}$, and that $\vec{y} \parallel \vec{z}$. Use the diagram at the right to state two angles that are:

answers may vary

- a. Alternate interior angles

$\angle 1, \angle 7$

$\angle 10, \angle 3$

- b. Consecutive/same-side interior angles

$\angle 9, \angle 3$

- c. Corresponding angles

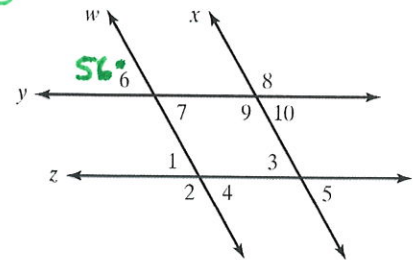
$\angle 1, \angle 6$ $\angle 7, \angle 4$

$\angle 8, \angle 5$

- d. Alternate exterior angles

$\angle 6, \angle 4$

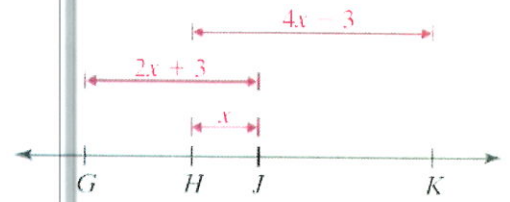
$\angle 8, \angle 5$



5. Using the same diagram as in #4, if $\angle 6$ has measure 56° , find the measure of $\angle 9$. (3 points)

$$180^\circ - 56^\circ = 124^\circ$$

6. Using the diagram at the right,
 a. write an algebraic expression for the length of GH , and for the length of JK . (4 points)



$$GH = x + 3$$

$$JK = 3x - 3$$

- b. If $GK = 30$, find the lengths of each segment GH , HJ , and JK . (4 points)

$$30 = x + 3 + x + 3x - 3$$

$$30 = 5x$$

$$x = 6$$

$$GH = 9$$

$$HJ = 6$$

$$JK = 15$$

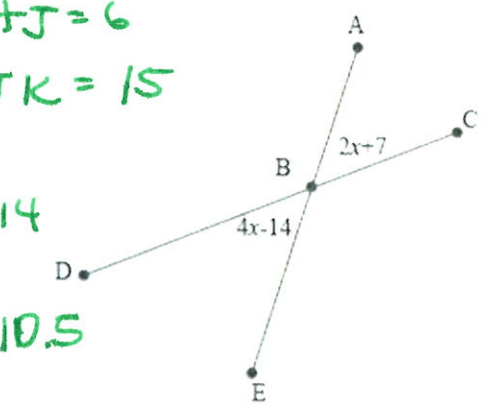
7. Find the measure of each angle. (4 points each)
 a. $\angle ABC$

$$2(10.5) + 7 = 28$$

$$2x + 7 = 4x - 14$$

$$21 = 2x$$

$$x = \frac{21}{2} = 10.5$$

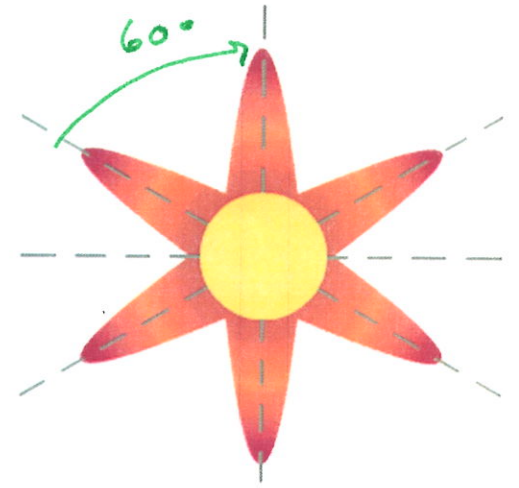


- b. $\angle EBC$

$$180 - 28 = 152$$

8. A flower has 6 petals. How far apart in degrees are the centers of each petal if the petals are evenly spaced? (5 points)

$$\frac{360^\circ}{6} = 60^\circ$$



9. Use the graph shown to answer the following questions.
 a. Find the length of side AD . (4 points)

$$d = \sqrt{(8-2)^2 + (10-8)^2} = \sqrt{36+4} = \sqrt{40}$$

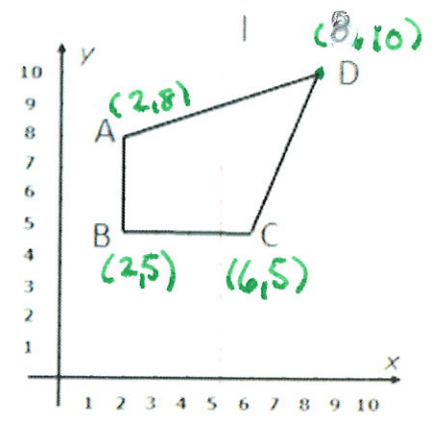
$$= 2\sqrt{10}$$

$$\approx 6.32$$

- b. Find the length of side CD . (4 points)

$$d = \sqrt{(8-6)^2 + (10-5)^2} = \sqrt{4+25} = \sqrt{29}$$

$$\approx 5.39$$



c. What is the perimeter of the quadrilateral $ABCD$? (4 points)

$$3 + 4 + 2\sqrt{10} + \sqrt{29} = 7 + 2\sqrt{10} + \sqrt{29} \approx 18.71$$

d. What is the midpoint of side AD ? (4 points)

$$\left(\frac{8+2}{2}, \frac{10+8}{2}\right) = \left(\frac{10}{2}, \frac{18}{2}\right) = (5, 9)$$

e. What is the slope of the line \overleftrightarrow{CD} ? (5 points)

$$m = \frac{10-5}{8-6} = \frac{5}{2}$$

10. Find the perpendicular bisector of the line shown below. (7 points)

