

CV | Geometry

Unit 1 Exam

NAME Key

Use the figure to name each of the following. (2 points each)

1. A line containing point A

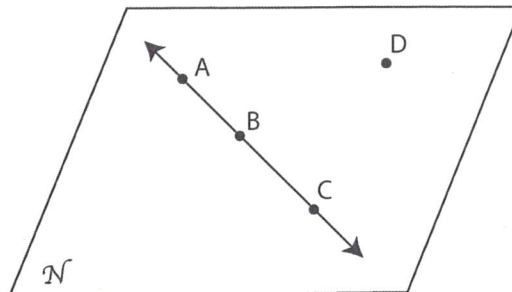
\leftrightarrow \leftrightarrow \leftrightarrow
AB, BC, or AC

2. A plane containing point D

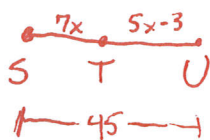
Plane ABD

Needs this point

or Plane N



3. Find the value of x and ST if T is between S and U , $ST = 7x$, $SU = 45$, and $TU = 5x - 3$. (2 points)



$$7x + 5x - 3 = 45$$

$$12x - 3 = 45$$

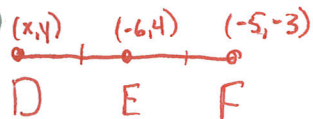
$$12x = 48$$

$$x = 4$$

$$ST = 7(4) = 28$$

$$ST = 28$$

4. Find the coordinates of D if $E(-6, 4)$ is the midpoint of \overline{DF} and F has coordinates $(-5, -3)$. (2 points)



$$E\left(\frac{x + -5}{2}, \frac{y + -3}{2}\right)$$

$$\frac{x + -5}{2} = -6$$

$$x + -5 = -12$$

$$x = -7$$

$$\frac{y - 3}{2} = 4$$

$$y - 3 = 8$$

$$y = 11$$

$$D(-7, 11)$$

5. Find the distance from D to F using the coordinates from problem number 4. (2 points)

$$d = \sqrt{(-7 - -5)^2 + (11 - -3)^2}$$

$$= \sqrt{4^2 + 14^2}$$

$$= \sqrt{16 + 196}$$

$$= \sqrt{212}$$

$$= 2\sqrt{53}$$

$$d = \sqrt{(-7 - -5)^2 + (11 - -3)^2}$$

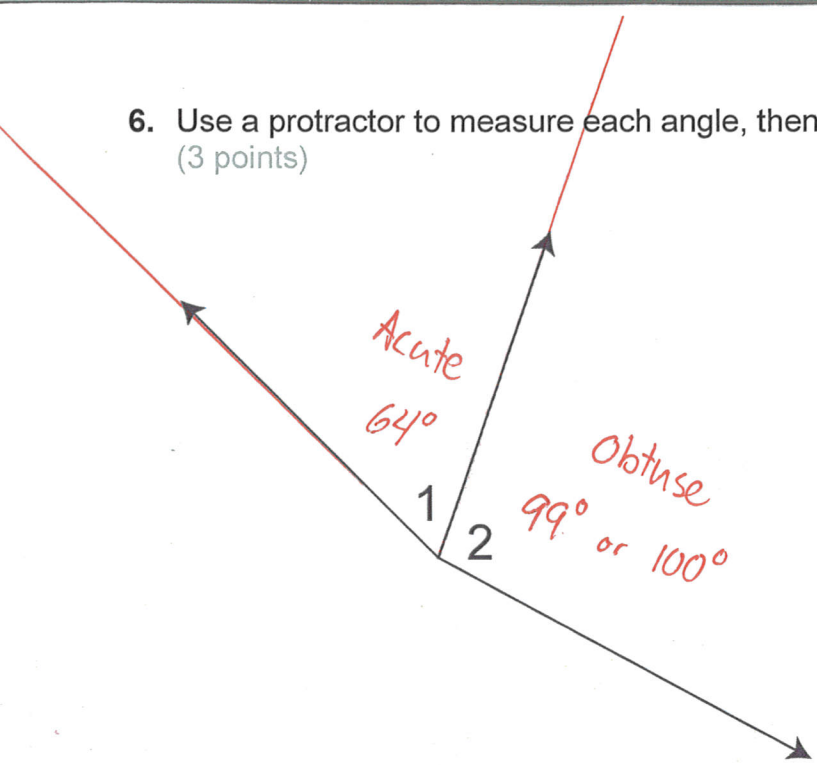
$$= \sqrt{4 + 196}$$

$$= \sqrt{200}$$

$$d = 14.1$$

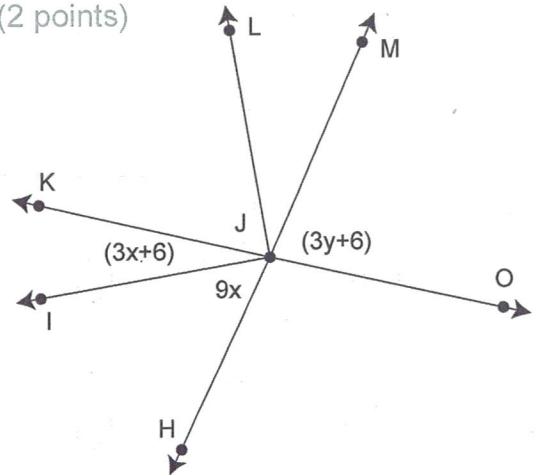
$$= 14.1$$

6. Use a protractor to measure each angle, then classify each as acute, right, or obtuse. (3 points)

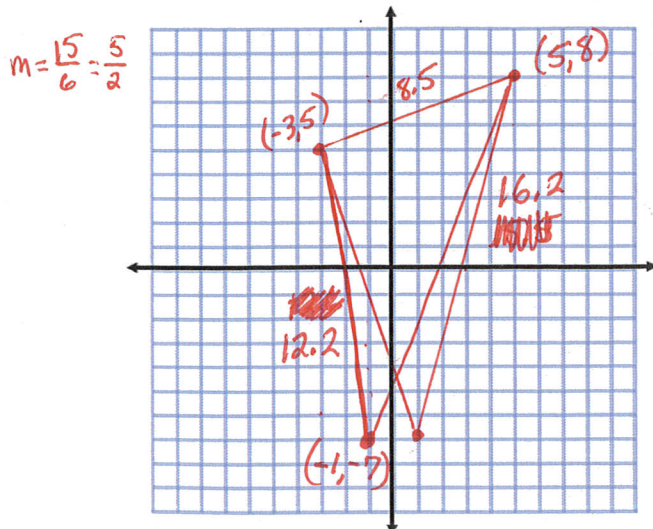


7. Find x and y so that \overline{KO} and \overline{MH} are perpendicular. (2 points)

$$\begin{aligned} 9x + 3x + 6 &= 90 \\ 12x + 6 &= 90 \\ 12x &= 84 \\ \boxed{x = 7} \end{aligned} \quad \left| \quad \begin{aligned} 3y + 6 &= 90 \\ 3y &= 84 \\ \boxed{y = 28} \end{aligned}$$



8. Graph the following figure, then find the perimeter and area of the figure. Round to the nearest tenth. (4 points)



$A(-3, 5), B(-1, -7), C(5, 8)$

~~Area = 1/2(6.3)(16.2)~~
~~Area = 1/2(6.3)(16.2)~~
 $\boxed{P = 36.9}$
 $\boxed{\text{Area} \approx 51}$

$$\begin{aligned} y &= \frac{5}{2}x + b \\ 8 &= \frac{5}{2}(5) + b \\ 8 &= \frac{25}{2} + b \\ 16 &= 25 + 2b \\ -9 &= 2b \\ -\frac{9}{2} &= b \\ -4\frac{1}{2} &= b \end{aligned} \quad \left| \quad \begin{aligned} y &= \frac{3}{5}x + b \\ 5 &= \frac{3}{5}(-3) + b \\ 5 &= \frac{6}{5} + b \\ 25 &= 6 + 5b \\ 19 &= 5b \\ \frac{19}{5} &= b \end{aligned}$$

$$\begin{aligned} d &= \sqrt{(2.9 - -3)^2 + (2.7 - 5)^2} \\ &= \sqrt{34.81 + 5.29} \\ &= \sqrt{40.1} \\ &\approx 6.3 \end{aligned}$$

Intersection = $(2.9, 2.7)$

9. Mike is creating a mailing tube which can be used to mail posters and architectural plans. The diameter of the base is $3\frac{3}{4}$ inches, and the height is $2\frac{2}{3}$ feet. Find each measure to the nearest tenth. (2 points each)

a. The amount of cardboard Mike needs to make the tube.

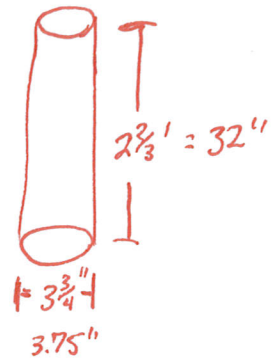
$$SA = 2(\pi(1.875^2)) + 3.75\pi \cdot 32$$

$$SA = \frac{399.1 \text{ in}^2}{399.1 \text{ in}^2} \text{ or } \boxed{2.8 \text{ ft}^2}$$

b. The volume of the tube.

$$V = (1.875^2 \pi) 32 = \boxed{353.4 \text{ in}^3}$$

or
 $\cdot 2$
~~ft~~ ft^3

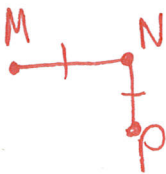


10. Make a conjecture about the next term in this sequence: (2 points)

5, -10, 20, -40, 80

previous term multiplied by -2

11. If $MN = NP$, then N is the midpoint of \overline{MP} . Find a counterexample. (2 points)



12. What is the truth-value of the following statement? (2 points)

$$\sqrt{25} > -5 \text{ or } 3 \leq 3$$

True

13. Suppose p is true and q is false. What is the truth-value of the conjunction $\sim p \wedge \sim q$?
(2 points)

False

14. Write the statement, *All Chickens have two wings*, in if-then form. (2 points)

If an animal is a chicken, then it has two wings.

15. Write the inverse of the statement. (2 points)

If two lines are parallel to a third line, then they are parallel to each other.

If two lines are not parallel to a third line,
then they are not parallel to each other.

16. Use the Law of Detachment to write a valid conclusion for the given information. (2 points)

- (1) If a football team wins the Big 10 championship, then they will play in the Rose Bowl.
(2) Ohio State wins the Big 10 championship.

Ohio State will play in the Rose Bowl.

17. Use the Law of Syllogism to write a valid conclusion for the given information. (2 points)

- (1) If today is Thursday, then Amy is off from work.
(2) If Amy is off from work then she will go to the gym to workout.

If today is Thursday, then Amy will go to the gym to workout.

18. Name the operation that transforms $4x - 2 = 7x + 7$ to $4x = 7x + 9$, then find the value of x .
(2 points)

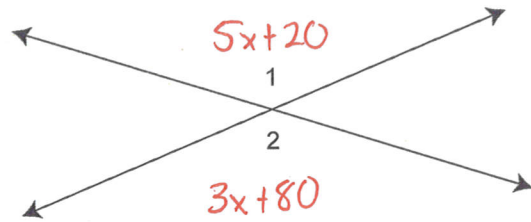
Addition

$$4x = 7x + 9$$
$$-3x = 9$$

$x = -3$

19. If $m\angle 1 = 5x + 20$ and $m\angle 2 = 3x + 80$ find $m\angle 1$. (2 points)

$$\begin{aligned}5x + 20 &= 3x + 80 \\2x &= 60 \\x &= 30 \\m\angle 1 &= 5(30) + 20 = 150 + 20 \\&= \boxed{170^\circ}\end{aligned}$$



Name the definition, property, postulate, or theorem that justifies each statement.

(2 points each)

20. If $AB = CD$, Then $CD = AB$

Symmetric Property

21. If $PQ = RS$, then $PQ + AB = RS + AB$.

Addition Property

22. If two angles form a linear pair, then they are supplementary.

Supplement theorem
or Definition of linear pair

Classify the relationship between each pair of angles. (2 points each)

23. 1 and 8

Alternate Exterior

24. 3 and 6

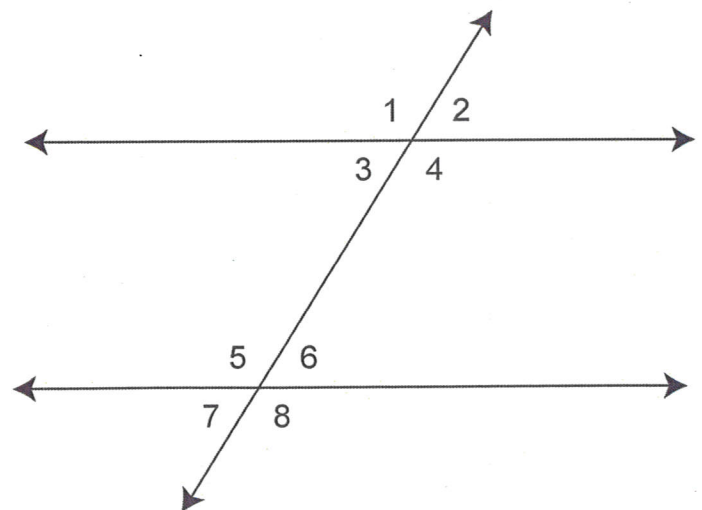
Alternate Interior

25. 4 and 6

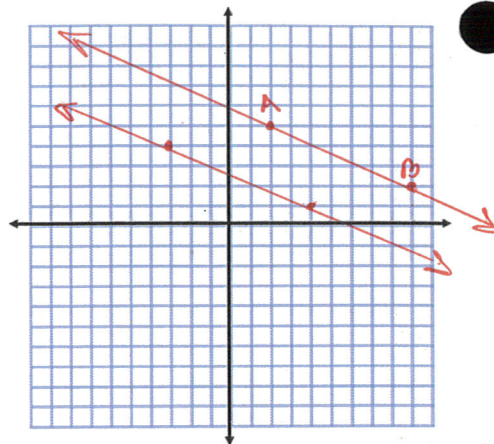
Consecutive Interior

26. 2 and 6

Corresponding



27. Graph the line that contains $(-3, 4)$ and is parallel to line AB with $A(2, 5)$ and $B(9, 2)$. (2 points)



28. Write an equation in slope-intercept form for the line with points $(-3, 12)$ and $(15, 0)$. (3 points)

$$m = \frac{12-0}{-3-15} = \frac{12}{-18} = -\frac{2}{3}$$

$$y = -\frac{2}{3}x + b$$

$$0 = -\frac{2}{3}(15) + b$$

$$0 = -10 + b$$

$$10 = b$$

$$y = -\frac{2}{3}x + 10$$

29. Find the distance between the following parallel lines with the given equations. (6 points)

$$y = -2x + 1 \quad (0, 1)$$

$$y = -2x + 16$$

Perpendicular

$$y = \frac{1}{2}x + b$$

$$1 = \frac{1}{2}(0) + b$$

$$1 = b$$

$$y = \frac{1}{2}x + 1$$

Intersection

$$y = \frac{1}{2}x + 1$$

$$y = -2x + 16$$

$$\frac{1}{2}x + 1 = -2x + 16$$

$$\frac{1}{2}x = -2x + 15$$

$$x = -4x + 30$$

$$5x = 30$$

$$x = 6$$

$$y = -2(6) + 16$$

$$y = -12 + 16$$

$$y = 4$$

$$(6, 4)$$

Distance

$$d = \sqrt{(6-0)^2 + (4-1)^2}$$

$$d = \sqrt{36 + 9}$$

$$d = \sqrt{45} \text{ or } 6.7$$