

Geometry Review for Final Exam Fall Semester 2019-2020

1. Write an equation in slope-intercept form that is perpendicular to $2x-4y=10$ and goes through $(4,1)$.

$$2x-4y=10$$

$$-4y=-2x+10$$

$$y=\frac{1}{2}x-\frac{5}{2}$$

So $m=\frac{1}{2}$

$\perp m = -2$ through $(4,1)$

$$y-y_1 = m(x-x_1)$$

$$y-1 = -2(x-4)$$

$$y-1 = -2x+8$$

$$y = -2x+9$$

2. Write an equation in slope-intercept form that is parallel to $x+3y=10$ and goes through $(2,3)$

$$x+3y=10$$

$$3y=-x+10$$

$$y=-\frac{1}{3}x+\frac{10}{3}$$

$m = -\frac{1}{3}$

$\parallel m = -\frac{1}{3}$ through $(2,3)$

$$y-y_1 = m(x-x_1)$$

$$y-3 = -\frac{1}{3}(x-2)$$

$$y-3 = -\frac{1}{3}x + \frac{2}{3}$$

$$y = -\frac{1}{3}x + \frac{11}{3}$$

3. Determine if the lines are parallel, perpendicular, or neither. Explain why.

$$-3x+9y=5$$

$$9y=3x+5$$

$$y=\frac{1}{3}x+\frac{5}{9}$$

$m = \frac{1}{3}$

$$6x-2y=4$$

$$-2y=-6x+4$$

$$y=3x-2$$

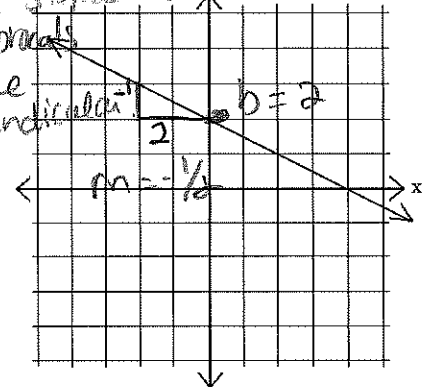
$m = 3$

neither, the slopes are not opposite reciprocals = so they are not parallel and the slopes are not opposite reciprocals so they are not perpendicular

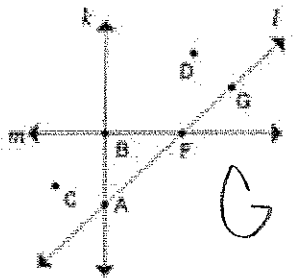
4. Write the equation of the given line in slope intercept form.

$$y = mx + b$$

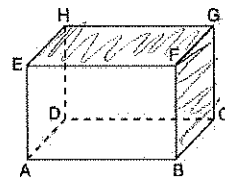
$$y = -\frac{1}{2}x + 2$$



5. Name a point collinear to A and F.

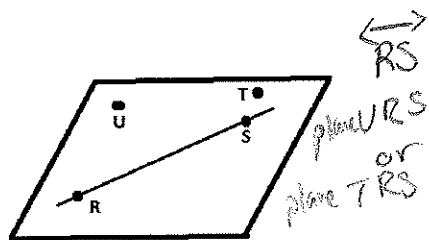


6. Name the intersection of plane HGEF and FGBC.



\overline{FG}

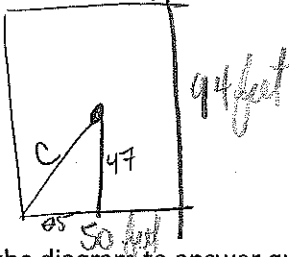
7. Name the line and the plane shown in the figure.



8. Angle 1 and Angle 2 are complementary. Angle 1 has a measure of x . What is the measure of angle 2?

$$x_2 = 90 - x$$

9. A basketball court is 50 feet by 94 feet. Find the distance from the corner of the court to the center of the center circle. (hint: draw a picture to help you.)



$$47^2 + 25^2 = c^2$$

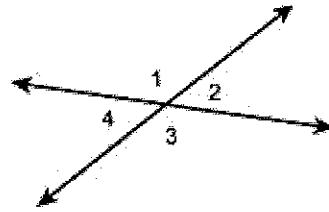
$$2834 = c^2$$

$$53.24 = c$$

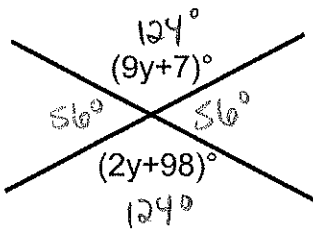
Use the diagram to answer question 10

10. Use a vocab word to describe the relationship between:

- a. Angle 1 and angle 3 *vertical ∠s*
- b. Angle 1 and angle 4 *Linear pair*



11. Find the measure of all 4 angles in the picture.



$$9y + 7 = 2y + 98$$

$$7y = 91$$

$$y = 13$$

$$9(13) + 7 = 124$$

$$180 - 124 = 56$$

12. Find the midpoint of (-6, 5) and (7, 9).

$$m = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$= \left(\frac{-6 + 7}{2}, \frac{5 + 9}{2} \right) = \left(\frac{1}{2}, \frac{14}{2} \right) = \left(\frac{1}{2}, 7 \right)$$

13. Find the distance between (-6,5) and (7,9).

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

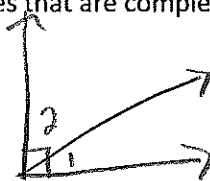
$$= \sqrt{(7 - (-6))^2 + (9 - 5)^2}$$

$$= \sqrt{(13)^2 + 4^2}$$

$$= \sqrt{185} = 13.60$$

14. Define complementary. Draw a picture of two angles that are complementary.

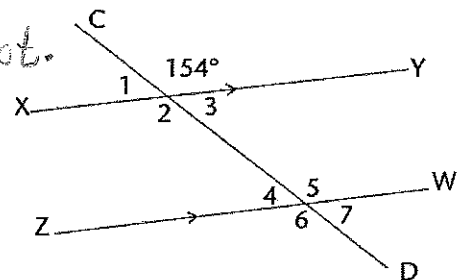
∠ angles that sum to 90°



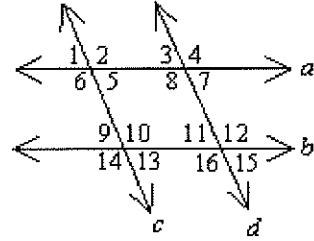
$$\angle 1 + \angle 2 = 90^\circ$$

15. Find the measure of each angle in the diagram to the right and explain how you found your answer:

- a. Angle 5 *154° corresponding*
- b. Angle 7 *180 - 154 = 26° same side ext.*
- c. Angle 6 *154° alternate exterior*
- d. Angle 4 *26° vertical to ∠7*



16. Name a pair of each of the following angles in the diagram.



Answers may vary

- e. Alternate interior $\angle 6 + \angle 10$
- f. Same side interior $\angle 6 + \angle 9$
- g. Corresponding $\angle 6 + \angle 14$
- h. Vertical $\angle 6 + \angle 2$
- i. Alternate exterior $\angle 1 + \angle 13$
- j. Same side exterior $\angle 1 + \angle 14$

17. Name the property of equality that justifies each statement below.

- a. If $m = n$ then $n = m$. *Symmetrical*
- b. $a = a$ *reflexive*
- c. If $a = k$ and $k = p$, then $a = p$. *transitive*

18. For the given conditional write each of the related statements below.

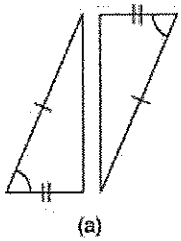
Conditional: If it is Friday, then I will wear jeans.

Converse: *If I will wear jeans, then it is Friday*

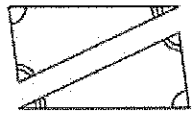
Inverse: *If it is not Friday, then I will not wear jeans*

Contrapositive: *If I will not wear jeans, then it is not Friday.*

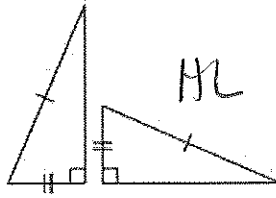
19. Can you prove each set of triangles are congruent? Explain using a congruence postulate or theorem.



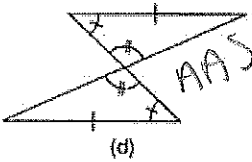
(a) SAS



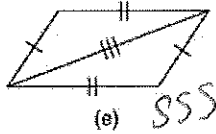
(b) Not \cong , AAA does not work



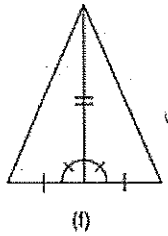
(c) HL



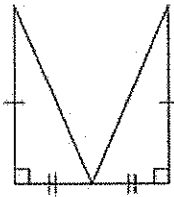
(d) AAS



(e) SSS



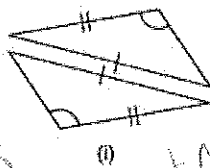
SAS



(g) SAS



(h) AAS

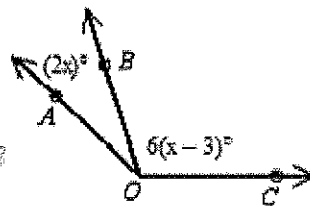


(i) Not congruent ASS does not work

20.

Given: $m\angle AOC = 150$

Prove: $x = 21$



Drawing not to scale

Statements	Reasons
1.) $m\angle AOC = 150$	1.) given
2.) $m\angle AOB + m\angle BOC = m\angle AOC$	2.) angle addition postulate
3.) $2x + 6(x-3) = 150$	3.) substitution
4.) $2x + 6x - 18 = 150$	4.) distributive property
5.) $8x - 18 = 150$	5.) combine like terms
6.) $8x = 168$	6.) addition P of E
7.) $x = 21$	7.) division P of E

Given: B is the midpoint of AC

Prove: $y = 9$



Statements	Reasons
1.) B is the midpoint of AC	1.) given
2.) $AB = BC$	2.) def. of midpoint
3.) $2y = 3y - 4$	3.) substitution
4.) $-y = -4$	4.) subtraction P of E
5.) $y = 4$	5.) division P of E

22. List the congruence theorems for triangles. Draw a picture of a pair of triangles for each one. (Hint: there are 5.)

- SSS
- SAS
- AAS
- ASA
- HL

23. Line AB contains points A (1,3) and B (2, 9).

- a. Find the slope of AB. $m = \frac{9-3}{2-1} = \frac{6}{1} = 6$
- b. Find the slope of a line parallel to AB. $m = 6$
- c. Find the slope of a line perpendicular to AB. $m = -\frac{1}{6}$

24. Show that each conditional is false by finding a counterexample

a. If it is not a weekday, then it is Saturday

Sunday

b. Odd integers less than 10 are prime

9

c. If you live in a country that borders the United States, then you live in Canada

Mexico

25. Define:

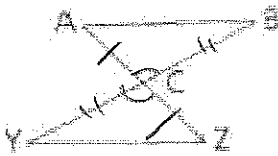
- a. Scalene triangle - Δ with no \cong sides
- b. Isosceles triangle - Δ with 2 \cong sides
- c. Equilateral triangle - Δ with 3 \cong sides

26. Write the three conditions that must be true for two triangles to be congruent using HL.

- 1.) right Δ 's
- 2.) \cong hypotenuses
- 3.) 1 pair of \cong legs

27. Given C is the midpoint of AZ and BY.

Prove: $\Delta ACB \cong \Delta ZCY$



Statements	Reasons
1.) C is the midpoint of AZ + BY	1.) given
2.) AC = CZ	2.) def. of midpoint
3.) BC = CY	3.) def. of midpoint
4.) $\angle ACB \cong \angle ZCY$	4.) vertical \angle 's
5.) $\Delta ACB \cong \Delta ZCY$	5.) SAS

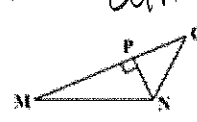
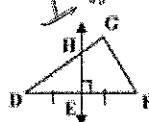
Name the special segment for #1-4

1) \overline{AC} *median*

2) \overline{HE} *altitude*

3) \overline{KL} *angle bisector*

4) \overline{PN} *altitude*



28.

	Through vertex	Through midpoint	Forms right angle	Picture
Median	Yes/no	Yes/no	Yes/no	
Altitude	Yes/no	Yes/no	Yes/no	
Angle bisector	Yes/no	Yes/no	Yes/no	
Perpendicular bisect	Yes/no	Yes/no	Yes/no	

29. The perimeter of $\triangle ABC$ is 72. $AB = 14x-4$, $BC = 12x$, $AC = 11x+2$. By solving for x , determine whether $\triangle ABC$ is:

$$14x - 4 + 12x + 11x + 2 = 72$$

$$37x - 2 = 72$$

$$37x = 74$$

$$x = 2$$

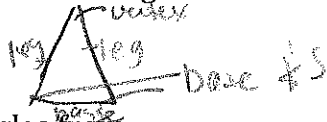
$$AB = 14(2) - 4 = 24$$

$$BC = 12(2) = 24$$

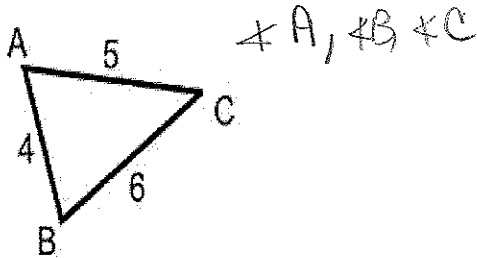
$$AC = 11(2) + 2 = 24$$

- a) scalene
- b) isosceles
- c) equilateral

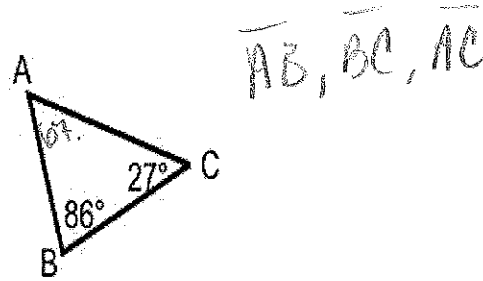
30. Draw an isosceles triangle. Label it's vertex angle, base angles, base and legs.



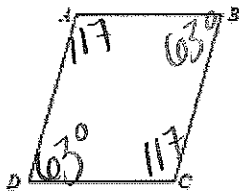
31. Order the angles from largest to smallest



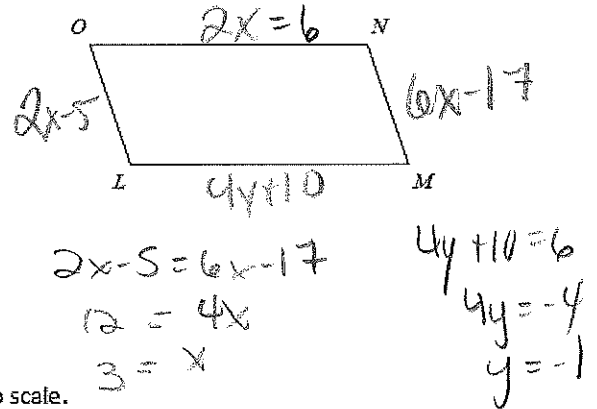
32. Order the sides from shortest to longest



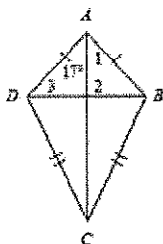
33. Find the measure of all angles in the figure. $ABCD$ is a parallelogram. If $m\angle CDA = 63^\circ$,



34. If $LMNO$ is a parallelogram, $OL = 2x-5$, $NM = 6x-17$, $ON = 2x$, and $LM = 4y+10$ find the values of x and y .



35. Find the measure of each angle in the kite. The diagram is not to scale.



$$\angle 1 = 17^\circ$$

$$\angle 2 = 90^\circ$$

$$\angle 3 = 73^\circ$$