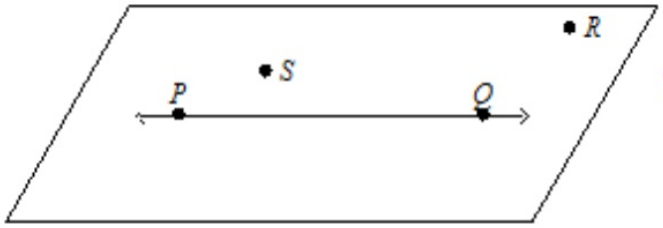
Geometry A Midterm Review

Name: **Hr:**

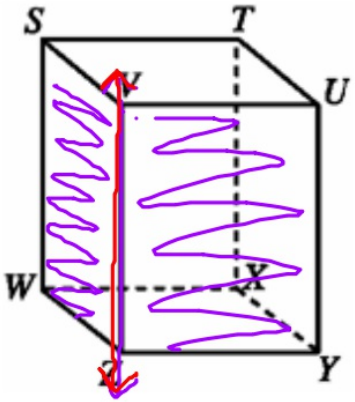
1. Name the line and plane shown in the diagram.



$\overleftrightarrow{PQ}$

Plane PQS

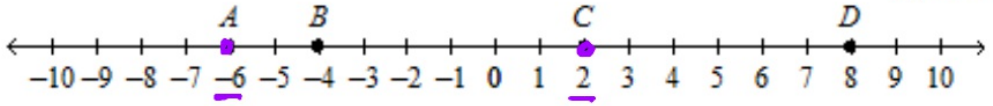
2. What is the intersection of plane *YZVU* and plane *ZWSV*?



$\overleftrightarrow{VZ}$

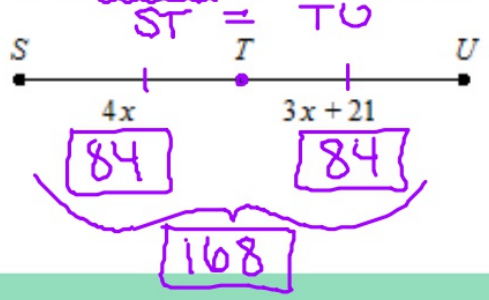
$\overleftrightarrow{VZ}$

3. What is the length of $\overline{AC}$?



$AC = |-6 - 2| = |-8| = \boxed{8}$

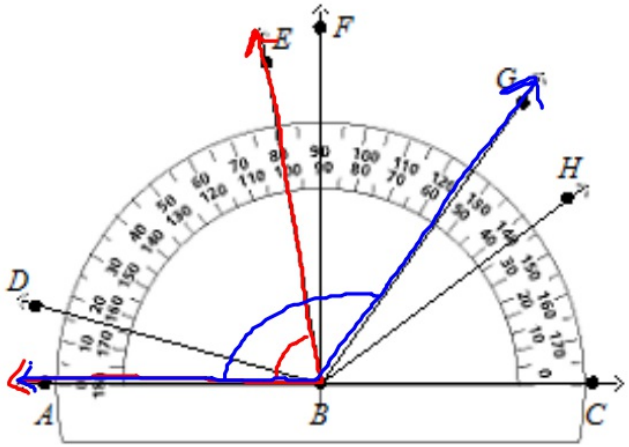
4. If T is the midpoint of $\overline{SU}$, what are ST, TU, and SU?



$4x = 3x + 21$
$-3x \quad -3x$
$x = 21$ ✓

$ST = 4(21) = 84$ ✓
$TU = 3(21) + 21 = 84$ ✓
$SU = 84 + 84 = 168$ ✓

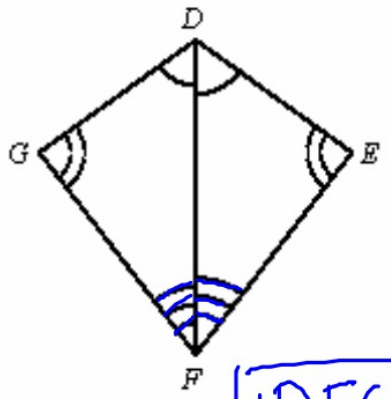
5. What are the measures of $\angle ABE$ and $\angle ABG$? Classify each angle as *acute*, *right*, *obtuse*, or *straight*.



$\angle ABE = 85°$ → Acute

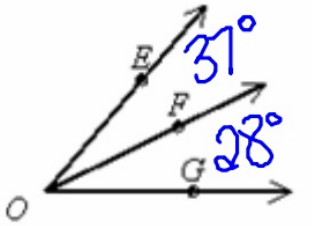
$\angle ABG = 125°$ → OBTUSE

6. Complete the statement.



$\angle DFE \cong$? ∠DFG

7. If $m\angle EOF = 37$ and $m\angle FOG = 28$, then what is the measure of $\angle EOG$? The diagram is not to scale.



∠EOF + ∠FOG = ∠EOG

37° + 28° = 65°

→ 90° TOGETHER!

8. The complement of an angle is 48°. What is the measure of the angle?

$90 - 48 = \boxed{42°}$

9. $\angle 1$ and $\angle 2$ are a linear pair. $m\angle 1 = x - 13$, and $m\angle 2 = x + 93$. Find the measure of each angle.

→ $\angle 1 + \angle 2 = 180°$

$x - 13 + x + 93 = 180$

$2x + 80 = 180$

$-80 \quad -80$

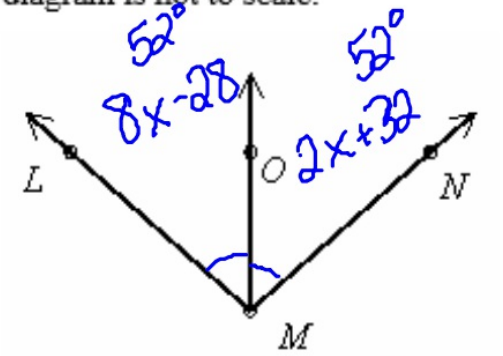
$\frac{2x}{2} = \frac{100}{2}$

$x = 50$

$m\angle 1 = 50 - 13 = \boxed{37°}$

$m\angle 2 = 50 + 93 = \boxed{143°}$

10. $\overrightarrow{MO}$ bisects $\angle LMN$, $m\angle LMO = 8x - 28$, and $m\angle NMO = 2x + 32$. Solve for x and find $m\angle LMN$. The diagram is not to scale.



$8x - 28 = 2x + 32$

$-2x \quad -2x$

$6x - 28 = 32$

$+28 \quad +28$

$\frac{6x}{6} = \frac{60}{6}$

$x = 10$ ✓

$m\angle LMN = 104°$

11. $M(2, 3)$ is the midpoint of $\overline{RS}$. The coordinates of S are $(3, 5)$. What are the coordinates of R? (x_2, y_2)?

? M

R S

X Y

$2 \cdot 2 = \frac{x_2 + 3}{2} \cdot 2$

$4 = x_2 + 3$

$-3 \quad -3$

$1 = x_2$ ✓

$2 \cdot 3 = \frac{y_2 + 5}{2} \cdot 2$

$6 = y_2 + 5$

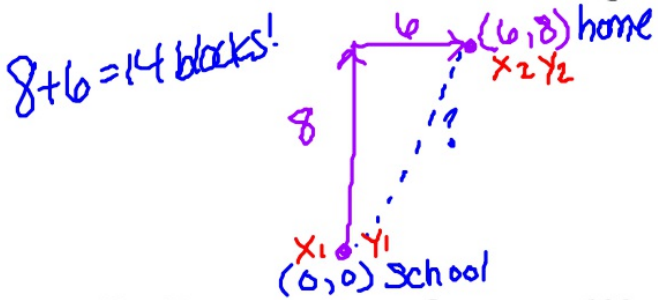
$-5 \quad -5$

$1 = y_2$

$(1, 1)$

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

12. Noam walks home from school by walking 8 blocks north and then 6 blocks east. How much shorter would his walk be if there were a direct path from the school to his house? Assume that the blocks are square.



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

$$d = \sqrt{(6-0)^2 + (8-0)^2}$$

$$d = \sqrt{(6)^2 + (8)^2}$$

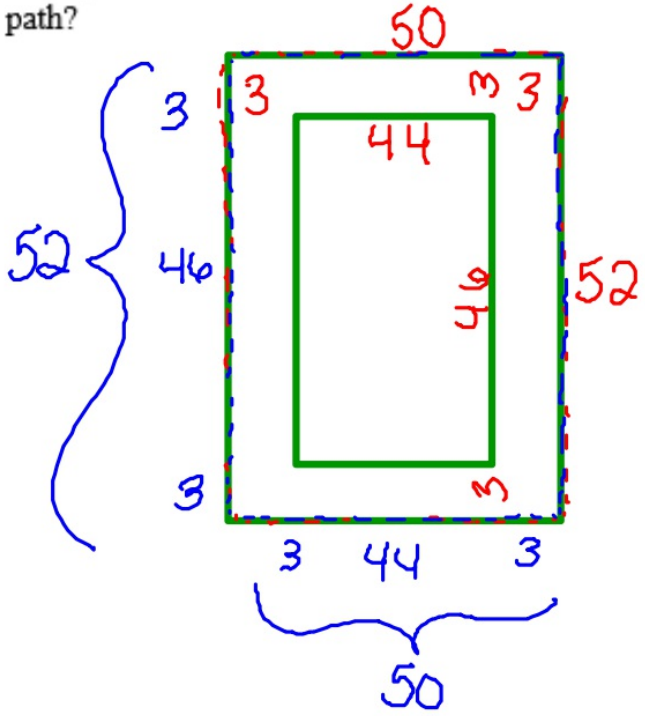
$$d = \sqrt{36 + 64}$$

$$d = \sqrt{100}$$

$d = 10$ BLOCKS!

$14 - 10 =$ 4 Blocks shorter

13. Dan wants to put a fence around his rectangular garden. His garden measures 44 feet by 46 feet. The garden has a path around it that is 3 feet wide. How much fencing material does Dan need to enclose the garden and path?

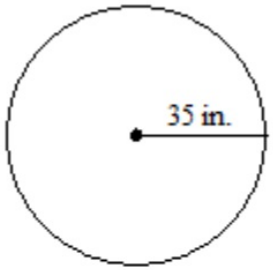


$P = 2(50) + 2(52)$

$P = 100 + 104$

$P = 204$ ft.

14. Find the circumference of the circle in terms of π.

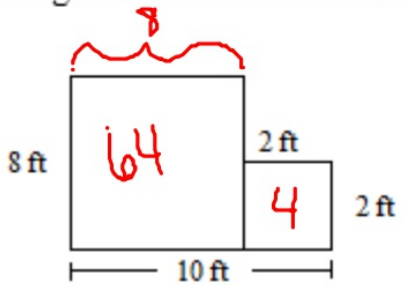


$C = 2\pi r$

$C = 2\pi(35)$

$C = 70\pi$ in

15. The figure is formed from rectangles. Find the total area. The diagram is not to scale.



$64 + 4 = 68$ ft^2

16. Based on the pattern, what are the next two terms of the sequence?
7, 10, 13, 16, ... 19, 22 +3

17. What is a counterexample for the conjecture?
Conjecture: Any number that is divisible by 6 is also divisible by 12.

18 or 30 ...

18. Identify the hypothesis and conclusion of this conditional statement:
If two lines intersect at right angles, then the two lines are perpendicular.

Hypothesis: two lines intersect at right angles
Conclusion: the two lines are perpendicular

19. Write this statement as a conditional in *if-then* form:
All triangles have three sides.

If a figure is a triangle, then it has three sides.

20. What is the converse of the following conditional? $q \rightarrow p$
If a point is in the fourth quadrant, then its coordinates are negative.

If a points coordinates are negative, then it is in the fourth quadrant.

21. What is the converse of the following true conditional? If the converse is true, rewrite the statements as a biconditional. If either is false, give a counterexample.
If two lines are parallel, they do not intersect.

Falses! they could be skew!

If two lines do not cross, then they are parallel.

22. Write the two conditional statements that make up the following biconditional.
I drink juice if (and only if) it is breakfast time.

$p \rightarrow q$ **If it is breakfast time, then I drink juice**

$q \rightarrow p$ **If I drink juice, then it is breakfast time**

$p \to q \cdot p \cdot \longrightarrow q \cdot$

23. Use the Law of Detachment to draw a conclusion from the two given statements.

If two angles are complementary, then the sum of their measures is 90°.

$\angle A$ and $\angle B$ are complementary.

$\angle A + \angle B = 90^\circ$

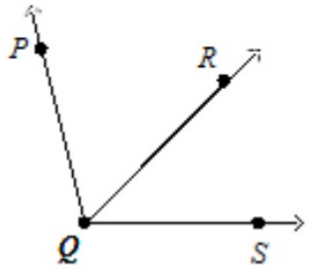
24. Use the Law of Syllogism to draw a conclusion from the two given statements.
If there is a storm, then there is thunder.
If there is thunder, Li's dog is under her bed.

$p \to q$ AND $q \to r$

$p \to r$!

★ **If there is a storm, then Li's dog is under the bed**

25. What is the value of x? Identify the missing justifications.
$m\angle PQR = x - 5$, $m\angle SQR = x - 5$, and $m\angle PQS = 100$.



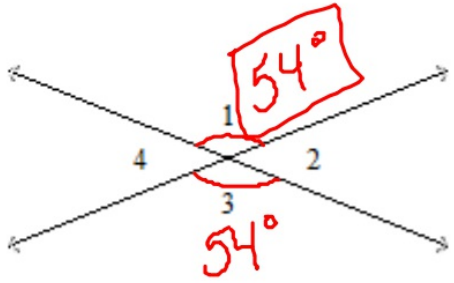
Drawing not to scale

$m\angle PQR + m\angle SQR = m\angle PQS$	**a.** Angle Addition Postulate
$x - 5 + x - 5 = 100$	**b.** Substitution Property
$2x - 10 = 100$	**c.** Simplify
$2x = 110$	**d.** Addition Property of Equality
$x = 55$	**e.** Division Property of Equality

26. Name the Property of Congruence that justifies this statement:
If $\angle P \cong \angle Q$ and $\angle Q \cong \angle R$, then $\angle P \cong \angle R$.

Transitive Prop.

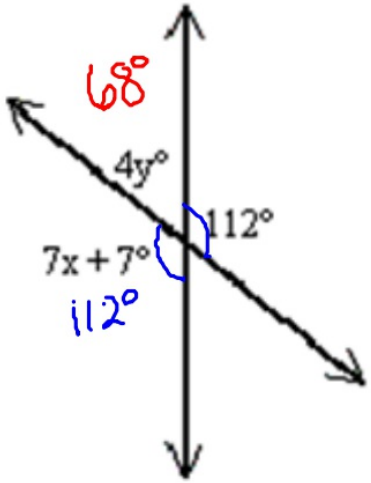
27. $m\angle 3 = 54$. Find $m\angle 1$.



Drawing not to scale

Vertical Angles!

28. Find the values of x and y.



Drawing not to scale

$\frac{4y}{4} = \frac{68}{4}$

$y = 14$

$7x + 7 = 112$

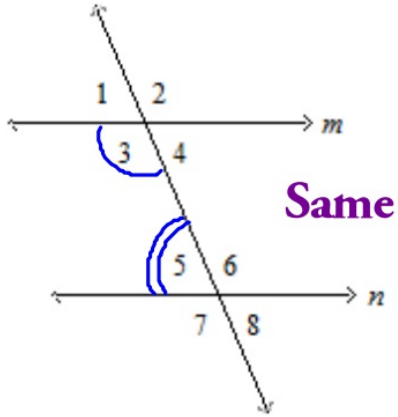
$-7 \quad -7$

$7x = 105$

$\frac{7x}{7} = \frac{105}{7}$

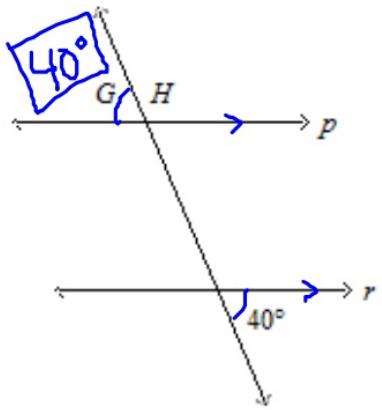
$x = 29$

29. What is the relationship between ∠3 and ∠5?



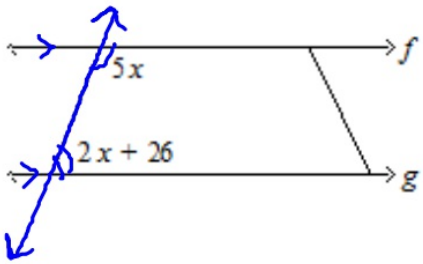
Same Side Interior Angles

30. Find $m\angle G$. $p \parallel r$. The diagram is not to scale.



(Alt. Exterior Angles → $\angle G = 40°$)

31. The expressions in the figure below represent the measures of two angles. Find the value of x. $f \parallel g$. The diagram is not to scale.



$5x + 2x + 26 = 180$

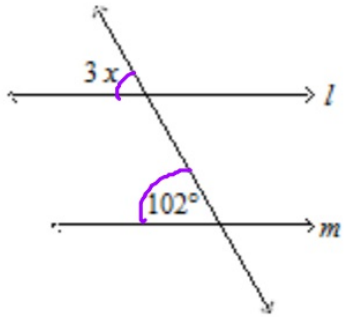
$7x + 26 = 180$

$-26 \quad -26$

$\frac{7x}{7} = \frac{154}{7}$

$\boxed{x = 22}$

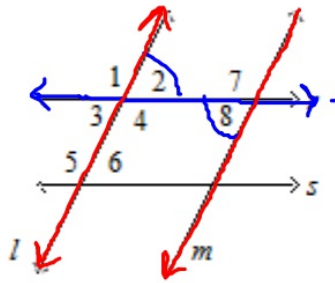
32. Find the value of x. $l \parallel m$. The diagram is not to scale.



$\frac{3x}{3} = \frac{102}{3}$

$X = 34$

33. Which lines are parallel if $m\angle 2 = m\angle 8$? Justify your answer.

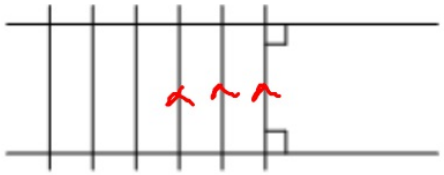


transversal

$l \parallel m$

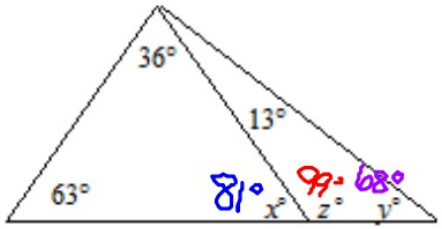
Alt. Interior Angles CONVERSE!

34. Each tie on the railroad tracks is perpendicular to both of the tracks. What is the relationship between the two tracks? Justify your answer.



They are parallel!

35. Find the values of x, y, and z. The diagram is not to scale.



$63+36+x=180$

$99+x=180$

$-99 \quad -99$

$x=81$ ✓

$180-81=z$

$99=z$ ✓

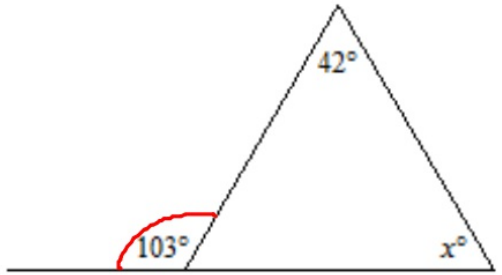
$13+99+y=180$

$112+y=180$

$-112 \quad -112$

$y=68$

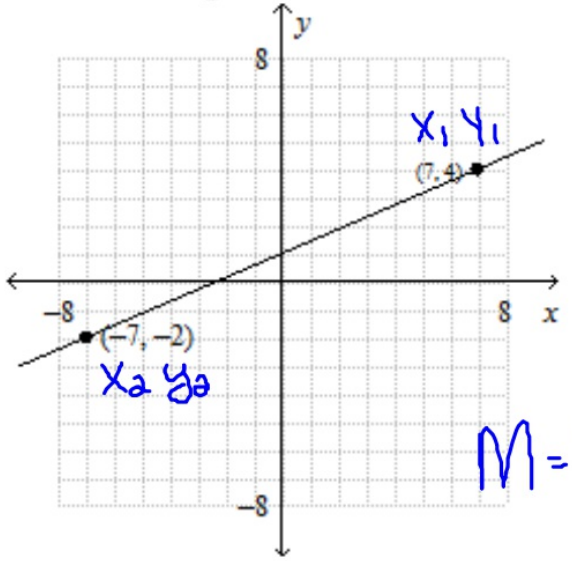
36. Find the value of x. The diagram is not to scale.



$103 = 42 + x$
$-42 \quad -42$
$61 = x$

$x = 61°$

37. What is the slope of the line shown?



$x_1\ y_1$

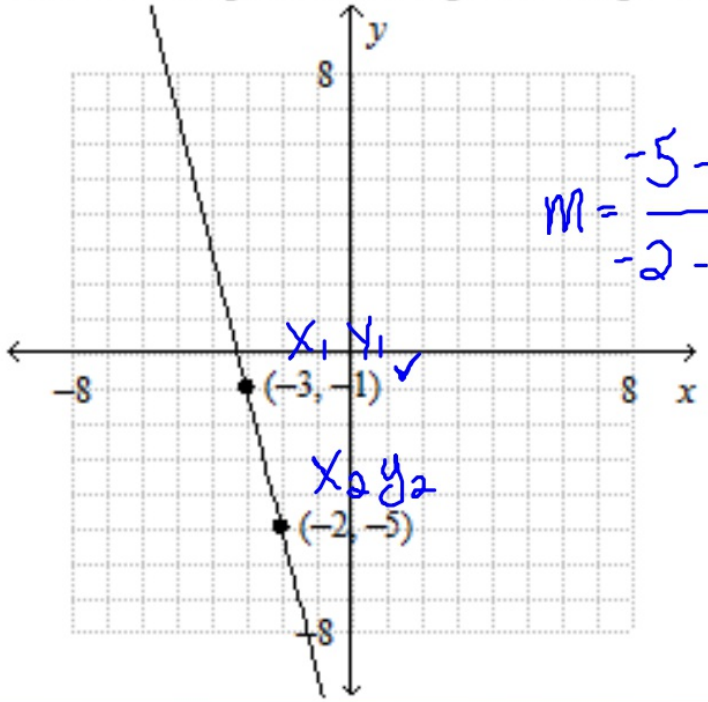
$x_2\ y_2$

$M = \frac{y_2 - y_1}{x_2 - x_1}$

$M = \frac{-2-4}{-7-7} = \frac{-6}{-14} = \frac{6}{14} \div 2 = \boxed{\frac{3}{7}}$

$y = mx + b$

38. What is an equation in slope-intercept form for the line given?



$x_1\ y_1$ ✓

$x_2\ y_2$

$$m = \frac{-5 - -1}{-2 - -3} = \frac{-4}{1} = -4$$

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

$y - -1 = -4(x - -3)$

$y + 1 = -4(x + 3)$

$y + 1 = -4x - 12$

$-1 \qquad -1$

$y = -4x - 13$

39. What is the equation in point-slope form for the line parallel to $y = 3x - 5$ that contains $P(-5, -6)$?

$m = 3$

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

$y - -6 = 3(x - -5)$

$\boxed{y + 6 = 3(x + 5)}$

$y + 6 = 3x + 15$

$-6 \quad\quad -6$

$\boxed{y = 3x + 9}$

40. What is an equation in point-slope form for the line perpendicular to $y = -2x - 1$ that contains $(-8, -1)$

x_1, y_1

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

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

$y - -1 = \frac{1}{2}(x - -8)$

$\boxed{y + 1 = \frac{1}{2}(x + 8)}$

$y + 1 = \frac{1}{2}x + 4$

$-1 \quad\quad -1$

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