

Name: Key

Geometry Unit 1 Exam Review

(Chapters P, 1, 2, and 3)

Lesson 1-1

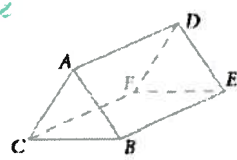
Find the next two terms in each sequence.

- | | |
|--|--|
| 1. 12, 17, 22, 27, 32, ... <u>37, 42</u> | 2. 1, 1.1, 1.11, 1.111, 1.1111, ... <u>1.11111</u> |
| 3. 5000, 1000, 200, 40, ... <u>8, $\frac{8}{5}$</u> | 4. 1, 12, 123, 1234, ... <u>12345</u> |
| 5. 3, 0.3, 0.03, 0.003, ... <u>0.0003</u> | 6. 1, 4, 9, 16, 25, ... <u>36, 49</u> |

Lessons 1-3 and 1-4

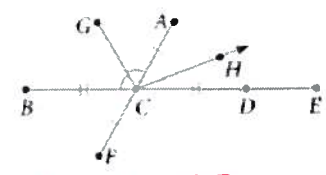
Write true or false.

- | | |
|---|--|
| 18. A, D, F are coplanar. <u>yes True</u> | 19. \overleftrightarrow{AC} and \overleftrightarrow{FE} are coplanar. <u>False</u> |
| 20. A, B, E are coplanar. <u>yes True</u> | 21. D, A, B, E are coplanar. <u>True</u> |
| 22. $\overleftrightarrow{FC} \parallel \overleftrightarrow{EF}$ <u>False</u> | 23. plane ABC \parallel plane FDE <u>True</u> |
| 24. \overleftrightarrow{BC} and \overleftrightarrow{DF} are skew lines. <u>True</u> | 25. \overleftrightarrow{AD} and \overleftrightarrow{EB} are skew lines. <u>False</u> |
| 26. $\overleftrightarrow{DE} \parallel \overleftrightarrow{CF}$ <u>False</u> | 27. D, E, and B are collinear. <u>False</u> |
28. What is the intersection of plane ABC and plane FAD? \overleftrightarrow{AC}
29. Two lines that intersect always intersect in a point.
30. Two planes that intersect always intersect in a line.
31. How are parallel lines different than skew lines? parallel lines are on same plane

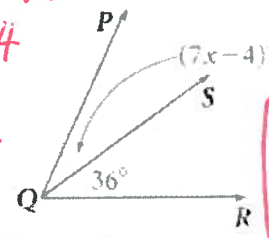


Lessons 1-5 and 1-6

32. Name the ray opposite ray CD. \overrightarrow{CB}
34. $m\angle BCG = 60$, $m\angle GCA = 60$, and $m\angle BCA = 120$
35. $m\angle ACD = 60$ and $m\angle DCH = 20$. Find $m\angle HCA$.
 $60 - 20 = 40$ $m\angle HCA = 40$
32. Algebra $BC = 3x + 2$ and $CD = 5x - 10$. Solve for x.
 $3x + 2 = 5x - 10 \rightarrow 12 = 2x$
33. Algebra If $AC = 5x - 16$ and $CF = 2x - 4$, then $AF =$.
 $5x - 16 = 2x - 4 \rightarrow 3x = 12$
 $x = 4$
 $5(4) - 16 + 2(4) - 4 = AF$
 $4 + 4$
 $AF = 8$



36. Algebra In the figure at the right, $m\angle PQR = 4x + 47$. Find $m\angle PQS$.
 $7x - 4 + 36 = 4x + 47 \rightarrow 7x + 32 = 4x + 47 \rightarrow 3x = 15$
 $x = 5$
37. Algebra Points A, B, and C are collinear with B between A and C. $AB = 4x - 1$, $BC = 2x + 1$, and $AC = 8x - 4$. Find AB, BC, and AC.



$4x - 1 + 2x + 1 = 8x - 4$
 $6x = 8x - 4$
 $-2x = -4$
 $x = 2$

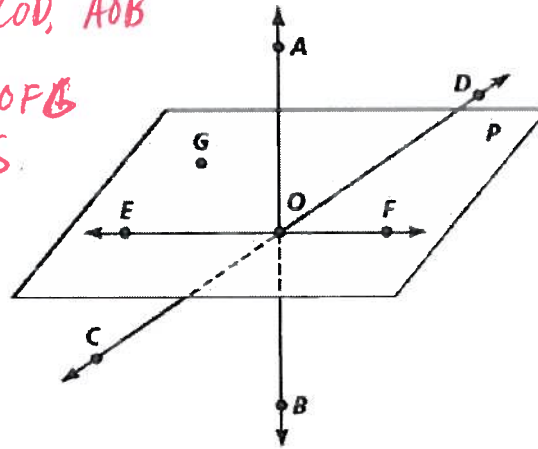
$AB = 4(2) - 1$
 $AB = 7$
 $BC = 2(2) + 1$
 $BC = 5$

$AC = AB + BC$
 $AC = 7 + 5 = 12$

$7(5) - 4 + 36 = m\angle PQR$
 $35 - 4 + 36 = m\angle PQR$
 $67 = m\angle PQR$

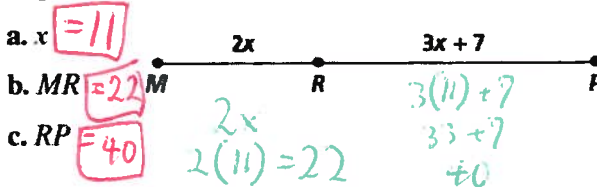
Use the figure to answer Exercises 8–11.

8. Name three collinear points. *Any of: EOF, COB, AOB*
9. Name four coplanar points. *Any of: EOFB*
10. Name four noncoplanar points. *vary answer: ABEG*
11. Find each intersection.



- a. \overleftrightarrow{CD} and plane P *point O*
- b. \overleftrightarrow{EF} and plane P *Line EF*
- c. \overleftrightarrow{AB} and \overleftrightarrow{CD} *point O*
- d. plane P and point G *point G*

16. Algebra $MP = 62$. Use the figure to find each of the following.



$$2x + 3x + 7 = 62$$

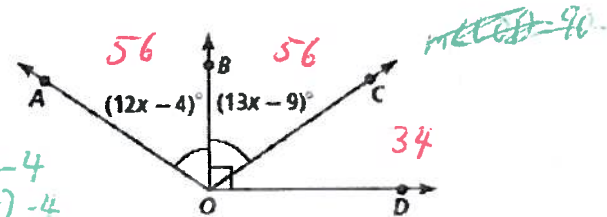
$$5x + 7 = 62$$

$$5x = 55$$

$$x = 11$$

Use the figure to find each measure in Exercises 17–22.

17. $m\angle AOB = 56$
19. $m\angle COD = 34$
21. $m\angle AOD = 146$
- 146 = 34 + 56 + 56*
- 12x + 4 = 13x - 9*
5 = x
- m\angle COD = 90 - m\angle BOC*
m\angle COD = 90 - 56 = 34
- m\angle AOB = 2x - 4*
= 12(5) - 4
= 60 - 4
= 56



Find the distance between each set of points to the nearest tenth.

30. $M(3, 2), N(7, 9)$

$$d = \sqrt{(3-7)^2 + (2-9)^2}$$

$$= \sqrt{(-4)^2 + (-7)^2}$$

$$= \sqrt{65} = 8.06$$

31. $C(-3, 8), D(5, 5)$

$$d = \sqrt{(-3-5)^2 + (8-5)^2}$$

$$= \sqrt{8^2 + (-3)^2}$$

$$= \sqrt{64 + 9} = \sqrt{73} = 8.54$$

32. $R(0, 12), S(8, -6)$

$$d = \sqrt{(0-8)^2 + (12-(-6))^2}$$

$$= \sqrt{8^2 + (18)^2}$$

$$= \sqrt{64 + 324}$$

33. The coordinates of the midpoint of AC are $(2, -3)$. The coordinates of A are $(0, 5)$. Find the coordinates of C .

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

$$\text{Midpoint} = (2, -3)$$

$$\frac{x_2 + 0}{2} = 2$$

$$x_2 = 4$$

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

$$y_2 = -11$$

35. Find the midpoint of segment RS if point R has coordinates $(-4, 5)$ and point S has coordinates $(3, -1)$.

$$\left(\frac{-4 + 3}{2}, \frac{5 + (-1)}{2} \right) = \left(-\frac{1}{2}, 2 \right)$$

$$36) \quad 3x+6 + 2x-1 = 70$$

$$5x+5=90$$

$$5x=85$$

$$x=17$$

The measure of angle A is $3x + 6$ and the measure of angle B is $2x - 1$.

36. If A and B are complementary, what is the value of x?

37. If A and B are supplementary, what is the value of x?

$$3x+6 + 2x-1 = 180$$

$$5x+5=180$$

$$5x=175$$

$$x=35$$

Lessons 2-1 and 2-2

For Exercises 1-3, identify the hypothesis and conclusion of each conditional.

3. If lines k and m are skew, then lines k and m are not perpendicular.

hypothesis conclusion

For each of the statements, write the conditional form and then the converse of the conditional. If the converse is true, combine the statements as a biconditional.

5. The number one is the smallest positive square. A number is the smallest positive square if and only if it is the number one.

6. Rectangles have four sides. If a figure is a rectangle, then it has four sides. If a figure has four sides, then it is a rectangle.

9. Three points on the same line are collinear. Three points are on the same line if and only if they are collinear.

Lesson 2-2

Is each statement a good definition? If not, find a counterexample.

10. A real number is an even number if its last digit is 0, 2, 4, 6, or 8. Counterexample: 2.2 is not even

11. A circle with center O and radius r is defined by the set of points in a plane a distance r from the point O . good

12. A plane is defined by two lines. Can be defined by 3 points too.

13. Segments with the same length are congruent. Counterexample. good

For Exercises 14 and 15, write the two statements that form each biconditional. Tell whether each statement is true or false.

14. Lines m and n are skew if and only if lines m and n do not intersect. If lines m and n are skew, then they do not intersect. True

If lines m and n do not intersect, then they are skew. False, could be parallel.

15. A person can be president of the United States if and only if the person is a citizen of the United States.

If a person is president of the U.S. then the person is a U.S. citizen. True

If a person is a U.S. citizen, then the person can be president of the U.S. True

Lesson 2-3

Using the statements below, apply the Law of Detachment or the Law of Syllogism to draw a conclusion.

16. If Jorge can't raise money, he can't buy a new car. Jorge can't raise money.

Jorge can't buy a new car.

17. If Shauna is early for her meeting, she will gain a promotion. If Shauna wakes up early, she will be early for her meeting. Shauna wakes up early.

Shauna will gain a promotion.

18. If Linda's band wins the contest, they will win \$500. If Linda practices, her band will win the contest. Linda practices.

Linda's band will win \$500

19. If Brendan learns the audition song, he will be selected for the chorus. If Brendan stays after school to practice, he will learn the audition song. Brendan stays after school to practice.

Brendan

For Exercises 20–23, apply the Law of Detachment, the Law of Syllogism, or both to draw a conclusion. Tell which law(s) you used.

20. If you enjoy all foods, then you like cheese sandwiches. If you like cheese sandwiches, then you eat bread.

If you enjoy all foods, then you eat bread.

*Law
of
Syllogism*

21. If you go to a monster movie, then you will have a nightmare. You go to a monster movie.

*you will have a
nightmare.*

*Law
of
Detachment*

22. If Catherine is exceeding the speed limit, then she will get a speeding ticket. Catherine is driving at 80 mi/h. If Catherine is driving at 80 mi/h, then she is exceeding the speed limit.

Catherine will get a speeding ticket.

*Both are
laws used*

23. If Carlos has more than \$250, then he can afford the video game he wants. If Carlos worked more than 20 hours last week, then he has more than \$250. If Carlos works 15 hours this week, then he worked more than 20 hours last week.

*If Carlos works 15 hrs this week
then he can afford the video game.*

*Law of
Syllogism*

For Exercises 19–22, determine whether each statement is a good definition. If it is not, provide a counterexample.

19. A square has four congruent sides.

counterexample: Rhombus

20. Congruent angles have the same measure.

good

21. Supplementary angles are two angles whose measures add up to 180.

good

22. A bird is an animal with wings.

*bats also have
wings*

For each statement, (a) write the converse, and (b) decide whether the converse is true or false.

1. If a polygon is a triangle, then it has three sides.

If a polygon has 3 sides, then it is a triangle. - True

2. If George lives in Texas, then he lives in the United States.

If George lives in the U.S. then he lives in Texas. - False

3. If two angles are vertical angles, then they are congruent.

If two angles are congruent, then they are vertical angles. - False

For Exercises 14–17, use deductive reasoning to draw any possible conclusions. Write *not possible* if you cannot draw any conclusions.

14. If an animal is a snake, then it is a reptile. "Gordon" is a reptile.

not possible

15. If Susan gets a hit this inning, then we will win. Susan hits a triple.

not possible. We don't know if the triple was this inning.

16. If the bus is late, then we will be late for school. If we are late for school, then we will receive a tardy penalty.

If the bus is late, then we will receive a tardy penalty.

17. If two angles are complementary, then the sum of their measures is 90. $\angle A$ and $\angle B$ are complementary.

The sum of $\angle A$ and $\angle B$ ~~is~~ is 90.

18. Rewrite the following biconditional as two conditionals:

A quadrilateral is a rectangle if and only if it has four right angles.

If a quadrilateral is a rectangle, then it has 4 right angles.

If a quadrilateral has 4 right angles, then it is a rectangle.

For Exercises 19–22, determine whether each statement is a good definition. If it is not, provide a counterexample.

19. A square has four congruent sides.

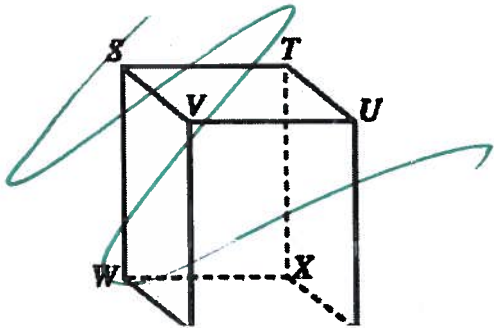
Not good. A rhombus

20. Congruent angles have the same measure. *good*

21. Supplementary angles are two angles whose measures add up to 180. *good*

22. A bird is an animal with wings. *Not good.*

A fly also has wings



Lesson 3-1

Find $m\angle 1$ and then $m\angle 2$. State the theorems or postulates that justify your answers.

1. $\angle 1 = 134$ by *SSI* being *Supplementary* $\angle 2 = 46$ by *AIA*

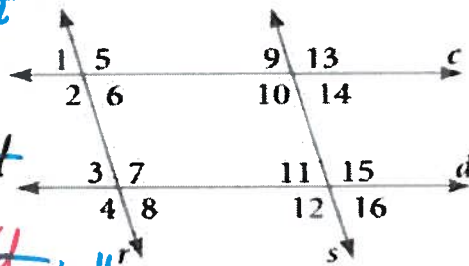
2. $\angle 1 = 125$ by *Corresponding Angles* $\angle 2$ is 55°

3. $\angle 1 = 58$ by *AIA* $\angle 2 = 122$ by *SSI*

4. $\angle 1 = 64$ by *AIA* $\angle 2 = 116$ by *SSI*

Refer to the diagram at the right. Use the given information to determine which lines, if any, must be parallel. If any lines are parallel, use a theorem or postulate to tell why.

6. $\angle 9 \cong \angle 14$ *can't tell anything*
8. $\angle 2$ is supplementary to $\angle 3$. *c//d by SSI*
10. $m\angle 6 = 60, m\angle 13 = 120$ *$m\angle 10 = 120$. so r//s*
12. $\angle 3$ is supplementary to $\angle 10$. *not enough info. r//s and c//d nothing*
7. $\angle 1 \cong \angle 9$ *r//s*
9. $\angle 7 \cong \angle 10$ *not enough info. r//s and c//d nothing*
11. $\angle 4 \cong \angle 13$ *r//s and c//d nothing*
13. $\angle 10 \cong \angle 15$ *c//d by AIA*



Algebra Find the value of each variable.

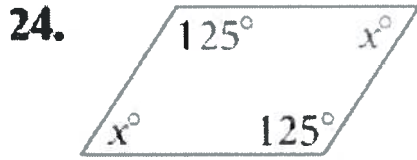
20. $180 - 130 = 2x$ $25 = x$
 $4y + 54 + 50 = 180$
 $4y = 76$
 $y = 19$

21. $(n-2)180$
 $(5-2)180$
 $540 = 94 + 106 + 135 + 2x + 5$
 $540 = 2x + 340$
 $200 = 2x$
 $100 = x$

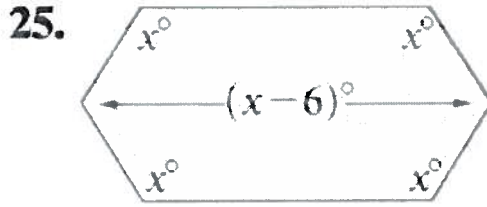
22. $x + 8 + x - 3 + 45 = 180$
 $2x + 50 = 180$
 $2x = 130$
 $x = 65$

23. $(n-2)180$
 $(4-2)180$
 360
 $Y = 102$
 $Z + 110 + 90 + 78 = 360$
 $Z = 82$

Algebra Find the missing angle measures.



$360 = 125 + 125 + 2x$
 $110 = 2x$
 $55 = x$
 Lessons 3-6



$(n-2)180$
 $(6-2)180$
 $720 = 6x - 12$
 ~~$720 = 732 = 6x$~~
 $122 = x$

Write an equation in point-slope form of the line that contains the given points.

26. $A(4, 2), B(6, -3)$
 $m = \frac{-3-2}{6-4} = \frac{-5}{2}$

$y + 3 = -\frac{5}{2}(x - 6)$

27. $C(-1, -1), D(1, 1)$

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

$m = \frac{1+1}{1-(-1)} = \frac{2}{2}$
 $m = 1$

Write an equation in slope-intercept form of the line through the given points.

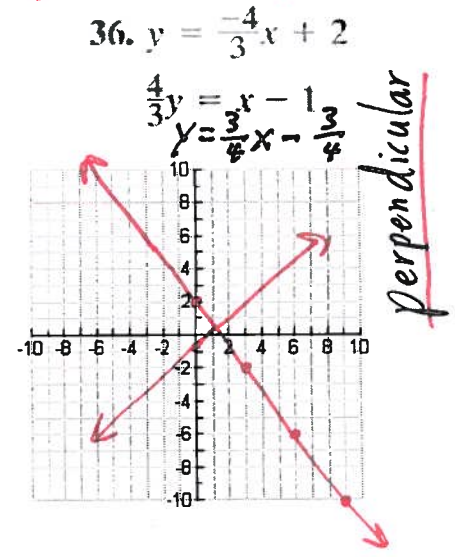
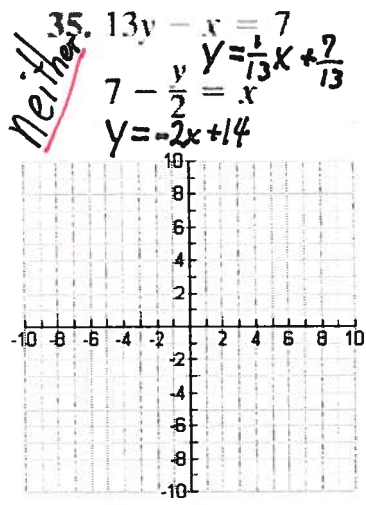
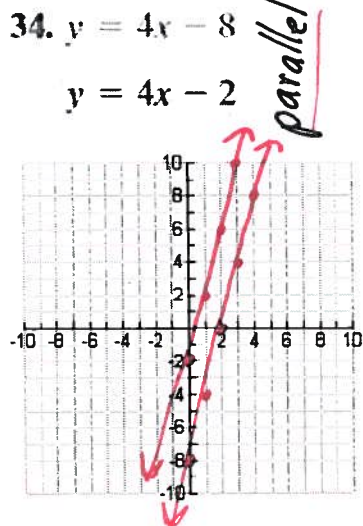
30. $H(2, 7), J(-3, 1)$
 $m = \frac{1-7}{-3-2} = \frac{-6}{-5} = \frac{6}{5}$
 $y - 7 = \frac{6}{5}(x - 2)$
 $y - 7 = \frac{6}{5}x - \frac{12}{5}$
 $y = \frac{6}{5}x + 4\frac{6}{5}$

31. $M(-2, 4), N(5, -8)$
 $m = \frac{-8-4}{5+2} = \frac{-12}{7}$
 $y - 4 = -\frac{12}{7}(x + 2)$
 $y - 4 = -\frac{12}{7}x - \frac{24}{7}$
 $y = -\frac{12}{7}x + \frac{4}{7}$

$y - 4 = -\frac{12}{7}(x + 2)$
 $y - 4 = -\frac{12}{7}x - \frac{24}{7}$
 $y = -\frac{12}{7}x + \frac{4}{7}$

Lessons 3-6 and 3-7

Graph each pair of lines and state whether they are parallel, perpendicular, or neither. Explain.



Solve for slope. Without graphing, tell whether the lines are parallel, perpendicular, or neither. Explain.

38. $2x + 3y = 5$ $y = -\frac{2}{3}x + \frac{5}{3}$ $5x - 10y = 30$ $y = \frac{1}{2}x - 3$ **neither**

39. $y = \sqrt{-2x + 7}$ $x - 2y = 8$ $y = \frac{1}{2}x - 4$ **perpendicular**

40. $5x - 3y = 0$ $y = \frac{5}{3}x$ **parallel**

Practice Chapter Test Chapter 3 Form A

Find $m\angle 1$ and $m\angle 2$. State the theorems or postulates that justify your answers.

9. $m\angle 2 = 55$ by AIA
 $m\angle 1 = 125$ by SSI

10. $m\angle 2 = 60$ by SSI
 $m\angle 1 = 60$ by vertical angles

11. $m\angle 2 = 95$ by SSI
 $m\angle 1 = 85$ by AIA

12. $m\angle 2 = 105$ by SSI or Supplementary
 $m\angle 1 = 75$ by CA

13. $m\angle 2 = 89$ by CA
 $m\angle 1 = 91$ by SSI

14. $m\angle 2 = 115$ by SSI
 $m\angle 1 = 60$ by AIA

Regular Polygon	# of Sides	Interior Angle Sum	ONE Interior angle	Exterior Angle Sum	ONE exterior angle
Pentagon	5	540	$\div 5 = 108$	360	$\div 5 = 72$
Octagon	8	1080	$\div 8 = 135$	360	$\div 8 = 45$
Decagon	10	1440	$\div 10 = 144$	360	$\div 10 = 36$
Dodecagon	12	1800	$\div 12 = 150$	360	$\div 12 = 30$
24-gon	24	3960	165	360	$\div 24 = 2015$
100-gon	100	17640	176.4	360	3.6

$(n-2)180$

Write the equation of each line described.

32. The line is perpendicular to $y = 2x + 17$ and contains $(8, -1)$.

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

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