Geometry: A Complete Course
(with Trigonometry)

Module C – Progress Tests

Written by: Larry E. Collins

ERRATA
3/2015

VideoText Interactive

Geometry: A Complete Course (with Trigonometry)
Module C - Progress Tests

Send all inquiries to:
Videotext*Interactive*
P.O. Box 19761
Indianapolis, IN 46219

ISBN 1-59676-102-4
4 5 6 7 8 9 10 - RPInc - 18 17 16 15 14

Table of Contents

Progress Tests

Part H - Theorems About Parallel Lines

Quiz Form A

Name ______________________________

Class ______________ Date ______________ Score ______________

Unit III - Fundamental Theorems
Part A - Deductive Proof
Lesson 1 - Direct Proof

1. Complete the deductive proof below by supplying the missing reasons.

Conditional: If $3x = 6 - \frac{1}{2}x$, then $x = \frac{12}{7}$ *Diagram:* —Not applicable—

Given: $3x = 6 - \frac{1}{2}x$ *Prove:* $x = \frac{12}{7}$

STATEMENT	REASON
1. $3x = 6 - \frac{1}{2}x$	1.
2. $2(3x) = 2(6) - 2\left(\frac{1}{2}x\right)$	2.
3. $2(3x) = 12 - 2\left(\frac{1}{2}x\right)$	3. Arithmetic Fact
4. $(2 \cdot 3)x = 12 - \left(2 \cdot \frac{1}{2}\right)x$	4.
5. $6x = 12 - \left(2 \cdot \frac{1}{2}\right)x$	5. Arithmetic Fact
6. $6x = 12 - 1x$	6.
7. $6x + 1x = 12 - 1x + 1x$	7.
8. $(6+1)x = 12 + (-1+1)x$	8.
9. $7x = 12 + (-1+1)x$	9. Arithmetic Fact
10. $7x = 12 + 0 \cdot x$	10.
11. $7x = 12 + 0$	11.
12. $7x = 12$	12.
13. $\frac{1}{7}(7x) = \frac{1}{7}(12)$	13.
14. $\frac{1}{7}(7x) = \frac{12}{7}$	14. Arithmetic Fact
15. $\left(\frac{1}{7} \cdot 7\right)x = \frac{12}{7}$	15.
16. $1 \cdot x = \frac{12}{7}$	16.
17. $x = \frac{12}{7}$	17.

Quiz Form B

Name ____________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems
Part A - Deductive Proof
Lesson 1 - Direct Proof

1. Complete the deductive proof below by supplying the missing reasons.

Conditional: If $x-2=\frac{2x+8}{5}$ *, then* $x=6$ *Diagram: —Not applicable—*

Given: $x-2=\frac{2x+8}{5}$ *Prove:* $x=6$

STATEMENT	REASON
1. $x-2=\frac{2x+8}{5}$	1.
2. $5(x-2)=5\left(\frac{2x+8}{5}\right)$	2.
3. $5\cdot x-5\cdot 2=5\left(\frac{2x+8}{5}\right)$	3.
4. $5\cdot x-5\cdot 2=1\cdot(2x+8)$	4.
5. $5x-5\cdot 2=1\cdot 2x+1\cdot 8$	5.
6. $5x-10=1\cdot 2x+1\cdot 8$	6. Arithmetic Fact
7. $5x-10=2x+8$	7.
8. $5x-10-2x=2x+8-2x$	8.
9. $5x-2x-10=2x-2x+8$	9.
10. $(5-2)x-10=(2-2)x+8$	10.
11. $3x-10=(2-2)x+8$	11. Arithmetic Fact
12. $3x-10=0x+8$	12.
13. $3x-10=0+8$	13.
14. $3x-10=8$	14.
15. $3x-10+10=8+10$	15.
16. $3x+0=8+10$	16.
17. $3x=8+10$	17.
18. $3x=18$	18. Arithmetic Fact
19. $\frac{1}{3}(3x)=\frac{1}{3}(18)$	19.
20. $\frac{1}{3}(3x)=6$	20. Arithmetic Fact
21. $\left(\frac{1}{3}\cdot 3\right)\cdot x=6$	21.
22. $1\cdot x=6$	22.
23. $x=6$	23.

Quiz Form A

Name ______________________________

Class ____________ Date ____________ Score ____________

Unit III - Fundamental Theorems
Part A - Deductive Proof
Lesson 2 - InDirect Proof

1. State the negation of each statement

a) It will not rain. ______________________________

b) △ABC is an isosceles triangle. ______________________________

c) "$x + 5$" is not an open phrase. ______________________________

2. Indicate whether each pair of statements would enable you to arrive at a contradiction in an indirect proof, and give some justification for your answer.

a) AB < 15; AB > 20 ______________________________

____

b) ∠X and ∠Y are obtuse angles; ∠X and ∠Y are supplementary. ______________________________

____

c) Point B is between points A and C; Points A, B, and C are not collinear. ______________________________

____

d) ∠P and ∠Q are congruent; ∠P and ∠Q are complementary. ______________________________

____

3. For each of the following conditionals, state the assumption you would use to start an indirect proof.

a) If a triangle is equilateral, then the triangle is isosceles. ______________________________

____

b) If an angle is a right angle, then the angle is equal to its supplement. ______________________________

____

Quiz Form B

Name ____________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems
Part A - Deductive Proof
Lesson 2 - InDirect Proof

1. State the negation of each statement

a) The adjacent sides are not parallel. ____________________

b) $\ell \perp n$. ____________________

c) "5 – 3 = 7" is a closed phrase. ____________________

2. Indicate whether each pair of statements would enable you to arrive at a contradiction in an indirect proof, and give some justification for your answer.

a) $\ell \parallel m$; Point X is contained in ℓ and m. ____________________

____

b) $\angle A$ and $\angle B$ form a linear pair; $m\angle A < 90$ and $m\angle B < 90$ ____________________

____

c) $\angle M$ and $\angle N$ are vertical angles; $\angle M$ and $\angle N$ are obtuse angles. ____________________

____

d) Point D is the midpoint of $\overline{AC}$; Points A, D, and C are not collinear. ____________________

____

3. For each of the following conditionals, state the assumption you would use to start an indirect proof.

a) If two adjacent angles are supplementary, then the angle bisectors of the two angles are perpendicular. ____________________

____

b) If two adjacent angles are supplementary, then their exterior sides lie in a straight line.

____

____

Quiz Form A

Name____

Class______________ Date______________ Score__________

Unit III - Fundamental Theorems

Part B - Theorems About Points and Lines

Lesson 1 - Theorem 1: "If a point lies outside a line, then exactly one plane contains the line and the point."

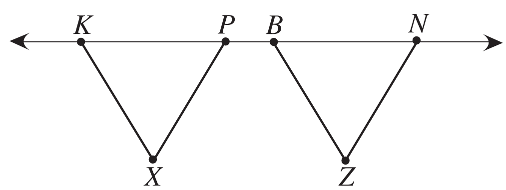
Lesson 2 - Theorem 2: "If three different points are on a line, then at most one is between the other two."

1. Referring to the diagram at the right, find the length of $\overline{PQ}$, if $\overline{PQ} \cong \overline{ST}$, RT = 9, and RS = 5.

Answer____

2. Given: $\overline{KB} \cong \overline{PN}$ as shown

Prove: $\overline{KP} \cong \overline{BN}$



STATEMENT	REASON

Quiz Form B

Name ______________________

Class __________ Date __________ Score __________

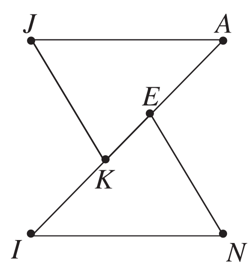
Unit III - Fundamental Theorems
Part B - Theorems About Points and Lines
Lesson 1 - Theorem 1: "If a point lies outside a line, then exactly one plane contains the line and the point."
Lesson 2 - Theorem 2: "If three different points are on a line, then at most one is between the other two."

1. Referring to the diagram at the right, find the length of $\overline{PR}$, if $\overline{PR} \cong \overline{QS}$, RS = 6, and QR = 4.

Answer ______________________

2. Given: $\overline{IK} \cong \overline{EA}$ as shown

Prove: $\overline{IE} \cong \overline{KA}$



STATEMENT	REASON

Quiz Form A

Name ______________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems
Part C - Theorems About Segments and Rays
Lesson 1 - Theorem 3: "If you have a given ray, then there is exactly one point at a given distance from the endpoint of the ray."
Lesson 2 - Theorem 4: "If you have a given line segment, then that segment has exactly one midpoint."

1. If AB > CD, is there a point X on $\overline{AB}$ such that AX = CD? Why or Why not? ______________________

____

____

2. $\overrightarrow{PQ}$ and $\overrightarrow{PR}$ are opposite rays. The coordinate of P is zero. The coordinate of R is 12. Is the coordinate of Q positive or negative? Why or why not? ______________________

____

____

3. Draw a diagram that illustrates the information given in the following problems.
a) Point C is on $\overrightarrow{AB}$, AC = 5, and AB is 8.

b) $\overrightarrow{AB}$ and $\overrightarrow{CD}$ intersect, but they are not collinear.

4. In the following problems, tell whether $\overrightarrow{AB}$ and $\overrightarrow{AC}$ are opposite rays. Answer "yes", "no" or "not enough information". Then draw a simple diagram to illustrate your answer.
a) AB = 6 and AC = 3. ______________________

b) B is the midpoint of $\overline{AC}$. ______________________

Quiz Form B

Name ____________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems

Part C - Theorems About Segments and Rays

Lesson 1 - Theorem 3: "If you have a given ray, then there is exactly one point at a given distance from the endpoint of the ray."

Lesson 2 - Theorem 4: "If you have a given line segment, then that segment has exactly one midpoint."

1. On $\overrightarrow{AB}$, if point X has coordinate 8, can a different point Y on $\overrightarrow{AB}$ have the coordinate 8? Why or why not?

____

____

2. On $\overrightarrow{MN}$, the coordinate of M is zero, and the coordinate of N is 5. If the coordinate of T is positive, is T on $\overrightarrow{MN}$? Why or why not? ______________________________

____

3. Draw a diagram that illustrates the information given in the following problems.

a) Points X, Y, Q and Z are collinear. $\overrightarrow{XY}$ and $\overrightarrow{QZ}$ do not intersect.

b) The intersection of two rays, $\overrightarrow{BC}$ and $\overrightarrow{AC}$, is a segment, $\overline{AB}$.

4. In the following problems, tell whether $\overrightarrow{AB}$ and $\overrightarrow{AC}$ are opposite rays. Answer "yes", "no" or "not enough information". Then draw a simple diagram to illustrate your answer.

a) A is midpoint of $\overline{BC}$. ______________________________

b) The positive real numbers are paired with points on $\overrightarrow{AB}$. ______________________________

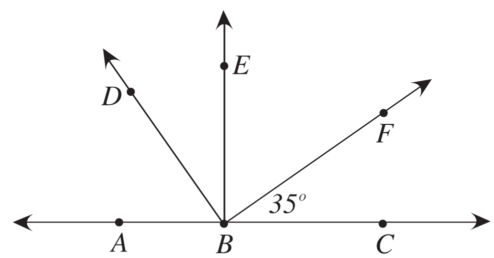
Quiz Form A

Name ____________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems
Part D - Theorems About Two Lines
Lesson 1 - Theorem 5: "If two different lines intersect, then exactly one plane contains both lines."
Lesson 2 - Theorem 6: "If in a plane, there is a point on a line, then there is exactly one point perpendicular to the line, through that point."

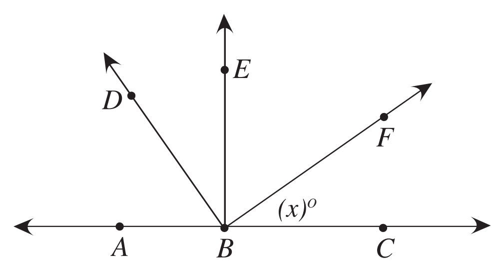
1. In the diagram to the right, $\overrightarrow{BE} \perp \overrightarrow{AC}$ and $\overrightarrow{BD} \perp \overrightarrow{BF}$. Find the measure of each of the following angles.



a) m∠EBF ________ b) m∠DBE ________

c) m∠DBA ________ d) m∠DBC ________

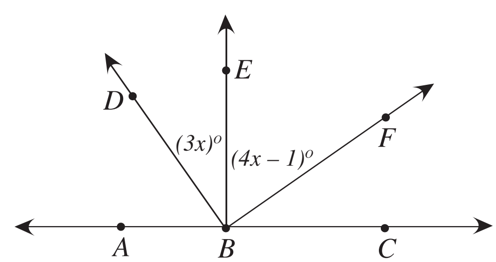
2. In the diagram to the right, $\overrightarrow{BE} \perp \overrightarrow{AC}$ and $\overrightarrow{BD} \perp \overrightarrow{BF}$. Also, assume m∠CBF = x. Express the measure of each of the following angles:



a) m∠EBF ________ b) m∠DBE ________

c) m∠DBA ________ d) m∠DBC ________

3. In the diagram to the right, $\overrightarrow{BE} \perp \overrightarrow{AC}$ and $\overrightarrow{BD} \perp \overrightarrow{BF}$. Find the value of x in each of the following problems.



a) m∠DBE = $3x$, m∠EBF = $4x – 1$ x = ____________

b) m∠ABD = $6x$, m∠DBE = $3x + 9$, m∠EBF = $4x + 18$, m∠FBC = $4x$ x = ____________

Quiz Form B

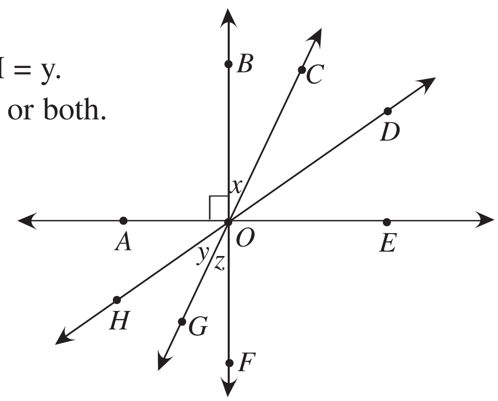
Name ______________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems
Part D - Theorems About Two Lines

Lesson 1 - Theorem 5: "If two different lines intersect, then exactly one plane contains both lines."

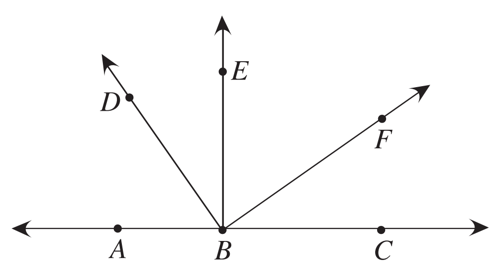
Lesson 2 - Theorem 6: "If in a plane, there is a point on a line, then there is exactly one point perpendicular to the line, through that point."



1. In the diagram to the right, $\overrightarrow{BF} \perp \overrightarrow{AE}$, m∠BOC = x, and m∠GOH = y. Express the measure each of the following angles in terms of x, y, or both.

a) m∠COA ________ b) m∠COH ________

c) m∠HOF ________ d) m∠COE ________



2. In the diagram to the right, $\overrightarrow{BE} \perp \overleftrightarrow{AC}$, $\overrightarrow{BD} \perp \overrightarrow{BF}$. Find the value of x in each of the following problems.

a) m∠ABD = $2x - 15$, m∠DBE = x x = ________

b) m∠ABD = $3x - 12$, m∠DBE = $2x + 2$, m∠EBF = $2x + 8$ x = ________

Quiz Form A

Name ______________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems

Part E - Theorems About Angles - Part 1 (One Angle)

Lesson 1 - Theorem 7: "If, in a half-plane, there is ray in the edge of the half-plane then there is exactly one other ray through the endpoint of the given ray, such that the angle formed by the two rays has a given measure."

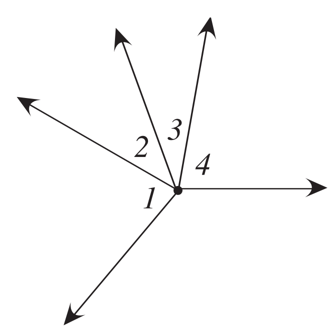
Lesson 2 - Theorem 8: "If, in a half-plane you have an angle, then that angle has exactly one bisector."

1. The measure of one of two adjacent angles is 10 more than twice the measure of the other. If the sum of their measures is 112, find the measure of each angle. (Note: This is a problem-solving situation, so you may want to use the analysis questions you developed in the Algebra course.)

measure of one-angle _________

measure of other angle _________

2. In the diagram, $m\angle 1 = 2(m\angle 2)$, $m\angle 2 + m\angle 3 + m\angle 4 = 150$, $m\angle 1 = m\angle 4$, and $m\angle 3 = 30$. Find $m\angle 1$, $m\angle 2$, and $m\angle 4$.

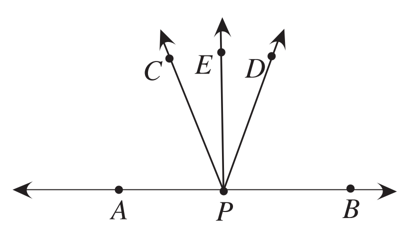


$m\angle 1 =$ _________

$m\angle 2 =$ _________

$m\angle 4 =$ _________

3. In the diagram, PE Bisects $\angle DPC$, $m\angle APC = 72$, and $\angle BPD = 70$. Find $m\angle APE$.



$m\angle APE$ _________

Quiz Form B

Name ______________________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems

Part E - Theorems About Angles - Part 1 (One Angle)

Lesson 1 - Theorem 7: "If, in a half-plane, there is ray in the edge of the half-plane then there is exactly one other ray through the endpoint of the given ray, such that the angle formed by the two rays has a given measure."

Lesson 2 - Theorem 8: "If, in a half-plane you have an angle, then that angle has exactly one bisector."

---

1. Draw and label a diagram according to the following instructions:

a) Mark points P and A on a line *m*. Let R and T be the half planes with edge line *m*.

b) Use a protractor to find a point B in plane R such that m∠APB = 110.

c) Choose a point C in half-plane T on $\overleftrightarrow{PB}$.

d) measure ∠APC with a protractor. What is its measure? ____________

e) How would you describe the relationship between ∠APB and ∠APC as a pair of angles? ____________

f) How would you describe the relationship between $\overrightarrow{PB}$ and $\overrightarrow{PC}$ as a pair of rays? ____________________

g) What is the sum of m∠APB and m∠APC? ____________________

2. A point X is in the interior of ∠PQR. If m∠PQX = 40, and m∠PQR = 110, what is m∠XQR? (Hint: draw and label a diagram.)

m∠XQR = _________

Quiz Form A

Name ______________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems

Part F - Theorems About Angles - Part 2 (Two Angles)

Lesson 1 - Theorem 9: "If two adjacent acute angles have their exterior sides in perpendicular lines, then the two angles are complementary."

Lesson 2 - Theorem 10: "If the exterior sides of two adjacent angles are opposite rays, then the angles are supplementary."

For each of the following statements 1 through 10, write either true or false.

1. Two angles may be both adjacent and congruent. ______________

2. Two angles may be both complementary and supplementary. ______________

3. If two angles are acute, they cannot be supplementary. ______________

4. If two lines intersect, then four pairs of supplementary and adjacent angles are formed. ______________

5. If $\angle AOB$ and $\angle BOC$ are supplementary and adjacent, then $\overrightarrow{OA}$ and $\overrightarrow{OC}$ cannot be a pair of opposite rays. ______________

6. If $\angle AOB$ and $\angle BOC$ are adjacent, then B lies inside $\angle AOC$. ______________

7. If two angles formed by two lines are adjacent, then they are supplementary. ______________

8. If B lies inside $\angle AOC$, then $\angle AOB$ and $\angle BOC$ are adjacent. ______________

9. If the measure of an angle is 120, the measure of the complement is 60. ______________

10. If $\angle AOB$ and $\angle BOC$ are adjacent, then $m\angle AOB + m\angle BOC = m\angle AOC$. ______________

Quiz Form B

Name ______________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems
Part F - Theorems About Angles - Part 2 (Two Angles)
Lesson 1 - Theorem 9: "If two adjacent acute angles have their exterior sides in perpendicular lines, then the two angles are complementary."
Lesson 2 - Theorem 10: "If the exterior sides of two adjacent angles are opposite rays, then the angles are supplementary."

1. Find the measures of ∠A and ∠B if m∠B = 9m∠A and if they are:

a) complementary: m∠A = __________ m∠B = __________

b) supplementary: m∠A = __________ m∠B = __________

2. Find the measures of ∠A and ∠B if m∠B = 28 + m∠A and if they are:

a) complementary: m∠A = __________ m∠B = __________

b) supplementary: m∠A = __________ m∠B = __________

3. May ∠AOB and ∠BOC be adjacent if m∠AOB + m∠BOC = x, where

a) $x = 90$? __________ b) $x = 180$? __________ c) $x < 180$? __________

d) $x > 180$? __________ e) $x < 360$? __________ f) $x = 360$? __________

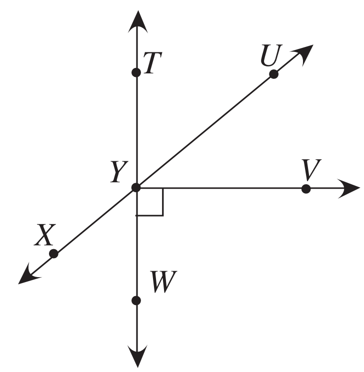
Quiz Form A

Name ____________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems
Part F - Theorems About Angles - Part 2 (Two Angles)
Lesson 3 - Theorem 11: "If you have right angles, then those right angles are congruent."
Lesson 4 - Theorem 12: "If you have straight angles, then those straight angles are congruent."

1. Name each of the following using the figure at the right.



a) Two pairs of opposite rays. ________________

b) Two right angles. ________________

c) Two straight angles. ________________

d) Three acute angles. ________________

e) Three obtuse angles. ________________

f) Two points in the exterior of ∠VYT ________________

g) The sides of ∠XYV ________________

h) The vertex of all angles. ________________

i) A point in the interior of ∠TYV ________________

j) An angle which is congruent to ∠WYV ________________

k) An angle which is congruent to ∠TYW ________________

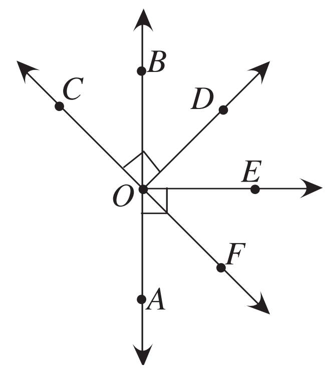
Quiz Form B

Name ____________________

Class ________ Date ________ Score ________

Unit III - Fundamental Theorems
Part F - Theorems About Angles - Part 2 (Two Angles)
Lesson 3 - Theorem 11: "If you have right angles, then those right angles are congruent."
Lesson 4 - Theorem 12: "If you have straight angles, then those straight angles are congruent."

1. Name each of the following using the figure at the right.



a) Three right angles. ______________

b) Two pairs of opposite rays. ______________

c) Two rays that are not opposite rays. ______________

d) Two straight angles. ______________

e) All acute angles. ______________

f) Four obtuse angles. ______________

g) Two points in the interior of ∠BOF ______________

h) The sides of ∠AOC. ______________

i) An angle which is congruent to ∠AOE ______________

j) An angle which is congruent to ∠COF ______________

k) Two points in the exterior of ∠COE. ______________

Quiz Form A

Name ____________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems

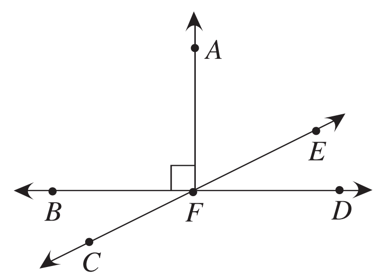
Part G - Theorems About Angles - Part 3 (More Than 2 Angles)

Lesson 1 - Theorem 13: "If two angles are complementary to the same angle or congruent angles, then they are congruent to each other."

Lesson 2 - Theorem 14: "If two angles are supplementary to the same angle or congruent angles, then they are congruent to each other."

Lesson 3 - Theorem 15: "If two lines intersect, then the vertical angles formed are congruent."

In the diagram, at the right, ∠AFB is a right angle. Name the figures described in exercises 1 through 6 below.



1. Another right angle ____________

2. Two complementary angles. ____________

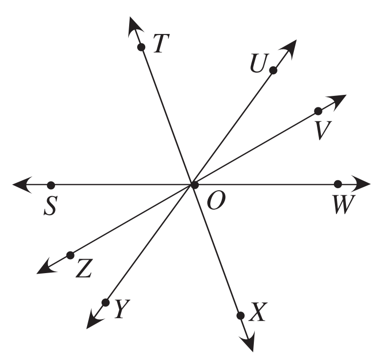
3. Two congruent supplementary angles. ____________

4. Two non-congruent supplementary angles. ____________

5. Two acute vertical angles. ____________

6. Two obtuse vertical angles. ____________

In the diagram, at the right, OT bisects ∠SOU, m∠UOV = 30 and m∠YOW = 126. Find the measure of each angle.



7. m∠VOW ____________

8. m∠ZOY ____________

9. m∠TOU ____________

10. m∠ZOW ____________

11. m∠UOS ____________

12. m∠TOZ ____________

Quiz Form B

Name ______________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems

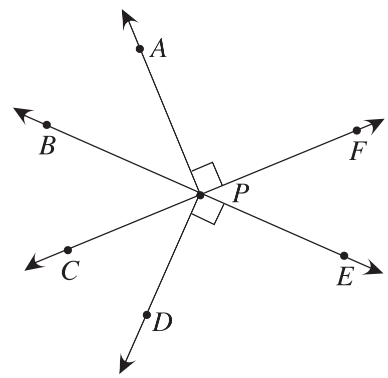
Part G - Theorems About Angles - Part 3 (More Than 2 Angles)

Lesson 1 - Theorem 13: "If two angles are complementary to the same angle or congruent angles, then they are congruent to each other."

Lesson 2 - Theorem 14: "If two angles are supplementary to the same angle or congruent angles, then they are congruent to each other."

Lesson 3 - Theorem 15: "If two lines intersect, then the vertical angles formed are congruent."

In the diagram, at the right, PA ⊥ CF and PD ⊥ BE. Refer to this diagram for exercises 1 through 6.



1. Find two supplementary angles for ∠FPE. ____________________

2. Find two complementary angles for ∠BPC. ____________________

3. ∠APB ≅ ∠CPD. Why? ______________________________________

____

____

4. ∠BPF ≅ ∠CPE. Why? ______________________________________

____

____

5. ∠BPC ≅ ∠FPE. Why? ______________________________________

____

____

6. If m∠BPC = 35°, then

a) m∠CPD = ______________

b) m∠FPE = ______________

c) m∠APB = ______________

7. If ∠A is complementary to ∠B, and if the measure of the supplement of ∠B is 122, Find m∠A.

m∠A = __________

Quiz Form A

Name ______________________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems
Part H - Theorems About Parallel Lines
Lesson 1 - Postulate 11: "If teo parallel lines are cut by a transversal, then corresponding angles are congruent."
Lesson 2 - Theorem 16: "If two parallel lines are cut by a transversal, then alternate interior angles are congruent."
Lesson 3 - Theorem 17: "If two parallel lines are cut by a transversal, then interior angles on the same side of the transversal are supplementary."

1. Complete the following conditional by writing three different true conclusions as given by Postulate 11, Theorem 16, and Theorem 17.

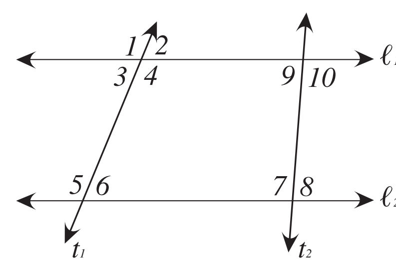
If two parallel lines are cut by a transversal, then

a) ______________________________

b) ______________________________

c) ______________________________

Use the diagram at the right, and only the numbered angles, for Exercises 2, 3, 4, and 5.



2. Using t_1 and t_2 as transversals, name all the pairs of corresponding angles.

__________ __________ __________

__________ __________ __________

3. Using ℓ_1 and ℓ_2 as transversals, name all the pairs of corresponding angles.

__________ __________ __________

__________ __________ __________

4. Using t_1 and t_2 as transversals, name all the pairs of interior angles on the same side of the transversal.

__________ __________ __________

__________ __________ __________

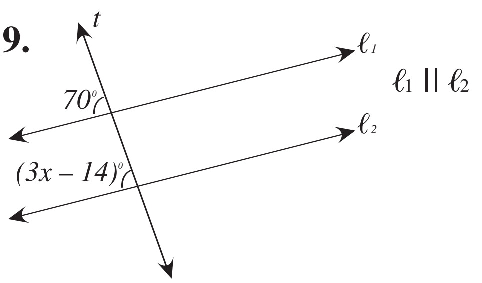
5. Using ℓ_1 and ℓ_2 as transversals, name all the pairs of vertical angles.

__________ __________ __________

__________ __________ __________

In Exercises 9 through 14, find the value of x by writing and solving an equation based on Postulate 11, Theorem 16, or Theorem17. Then name and state the postulate or theorem which applies in each case.

9.

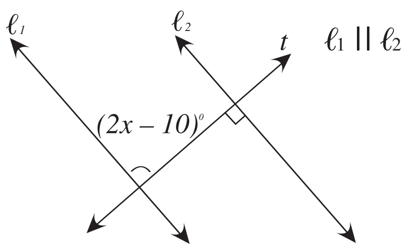


$x =$ __________

____

____

10.

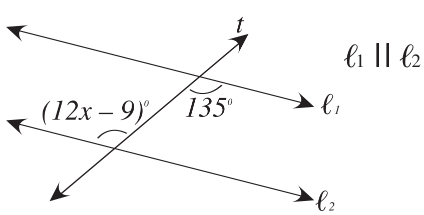


$x =$ __________

____

____

11.



$x =$ __________

____

____

Quiz Form B

Name ______________________

Class __________ Date __________ Score __________

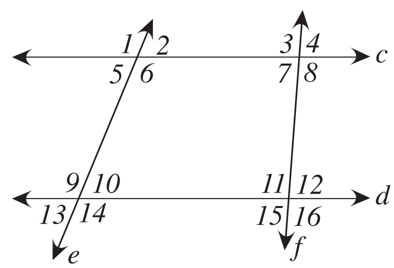
Unit III - Fundamental Theorems
Part H - Theorems About Parallel Lines

Lesson 1 - Postulate 11: "If teo parallel lines are cut by a transversal, then corresponding angles are congruent."

Lesson 2 - Theorem 16: "If two parallel lines are cut by a transversal, then alternate interior angles are congruent."

Lesson 3 - Theorem 17: "If two parallel lines are cut by a transversal, then interior angles on the same side of the transversal are supplementary."

Use the figure at the right to name all of the pairs of angles asked for in Exercises 1 through 4.



	For these Lines	And this Transversal	Name all pairs of Alternate Interior Angles	Name all pairs of Corresponding Angles	Name all pairs of Interior Angles of the same side of the transversal
1.	*c, d*	*e*	______ ______	______ ______	______ ______
2.	*c, d*	*f*	______ ______	______ ______	______ ______
3.	*e, f*	*c*	______ ______	______ ______	______ ______
4.	*e, f*	*d*	______ ______	______ ______	______ ______

Quiz Form A

Name ______________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems
Part H - Theorems About Parallel Lines

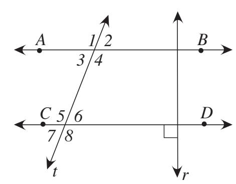
Lesson 4 - Theorem 18: "If a given line is perpendicular to one of two parallel lines, then it is perpendicular to the other."

Lesson 5 - Theorem 19: "If two lines are cut by a transversal so that corresponding angles are congruent, then the two lines are parallel."

Lesson 6 - Theorem 20: "If two lines are cut by a transversal so that alternate interior angles are congruent, then the two lines are parallel."

Lesson 7 - Theorem 21: "If two lines are cut by a transversal so that interior angles on the same side of the transversal are supplementary, then the two lines are parallel."

Refer to the given diagram at the right and the given information in Exercises 1 through 9. State the reason to justify $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$.



1. $m\angle 3 = 50$, $m\angle 6 = 50$ ______________________

2. $m\angle 1 = 130$, $m\angle 8 = 130$ ______________________

3. $m\angle 4 = 100$, $m\angle 6 = 80$ ______________________

4. $m\angle 1 = 120$, $m\angle 7 = 60$ ______________________

5. $m\angle 7 = 55$, $m\angle 3 = 55$ ______________________

6. $m\angle 2 = 65$, $m\angle 7 = 65$ ______________________

7. $m\angle 6 = 57$, $m\angle 2 = 57$ ______________________

8. $m\angle 4 = 110$, $m\angle 5 = 110$ ______________________

9. Why is line $r \perp \overleftrightarrow{AB}$? ______________________

Quiz Form B

Name ____________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems

Part H - Theorems About Parallel Lines

Lesson 4 - Theorem 18: "If a given line is perpendicular to one of two parallel lines, then it is perpendicular to the other."

Lesson 5 - Theorem 19: "If two lines are cut by a transversal so that corresponding angles are congruent, then the two lines are parallel."

Lesson 6 - Theorem 20: "If two lines are cut by a transversal so that alternate interior angles are congruent, then the two lines are parallel."

Lesson 7 - Theorem 21: "If two lines are cut by a transversal so that interior angles on the same side of the transversal are supplementary, then the two lines are parallel."

---

1. To prove two lines in the same plane are parallel, if they are cut by a transversal, you can show that one of five conditions is true. List the five conditions in a) through e) below. (three theorems; two corollaries)

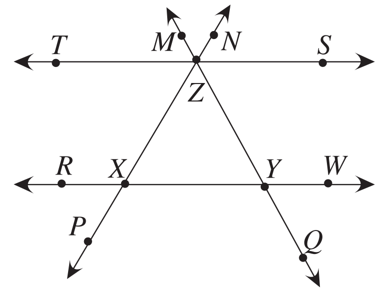
a) ______________________________

b) ______________________________

c) ______________________________

d) ______________________________

e) ______________________________



7. Use the diagram at the right to complete each conclusion below.

a) Given: m∠SZQ = 77; $\overleftrightarrow{TS} \parallel \overleftrightarrow{RW}$

Conclusion: m∠WYM = ________________

b) Given: m∠NXW = 65; $\overleftrightarrow{TS} \parallel \overleftrightarrow{RW}$

Conclusion: m∠TZP = ________________

c) Given: m∠RXP = 60; $\overleftrightarrow{TS} \parallel \overleftrightarrow{RW}$

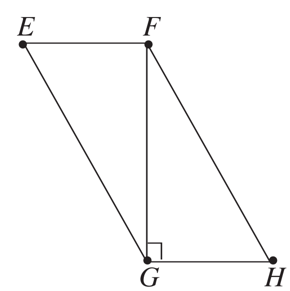
Conclusion: m∠NZS = ________________

d) Given: m∠MZT = 83; m∠RYQ = 97

Conclusion: ________________ || ________________

e) Given: m∠WYQ = 75; $\overleftrightarrow{TS} \parallel \overleftrightarrow{RW}$

Conclusion: m∠SZQ = ________________



8. Use the diagram at the right complete each conclusion below.

a) Given: $\overline{EF} \parallel \overline{HG}$, $\overline{FG} \perp \overline{GH}$

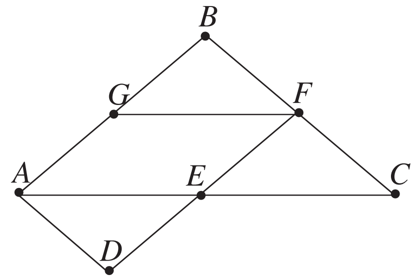
Conclusion: _____ ⊥ _____

b) Given: $\overline{EF} \perp \overline{FG}$, $\overline{HG} \perp \overline{GF}$

Conclusion: _____ || _____

11. Given: $\overline{AB} \parallel \overline{DF}$ and
$\angle BAC \cong \angle GFD$ as shown

Prove: $\overline{GF} \parallel \overline{AC}$



STATEMENT	REASON

Quiz Form A

Name ______________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems
Part H - Theorems About Parallel Lines
Lesson 8 - Theorem 22: "If two lines are perpendicular to a third line, then the two lines are parallel to each other."
Lesson 9 - Theorem 23: "If two lines are parallel to a third line, then the two lines are parallel to each other."
Lesson 10 - Theorem 24: "If two parallel planes are cut by a third plane, then the two lines of intersection are parallel."

In Exercises 1 through 10, classify each statement as always, sometimes, or never true. (circle your choice)

1. Two planes, each perpendicular to a third plane, are parallel to each other. Always Sometimes Never True

2. A plane that cuts one of two parallel lines cuts the other also. Always Sometimes Never True

3. In a plane, a line which intersects one of two parallel lines, intersects the other also. Always Sometimes Never True

4. A plane that contains two sides of a triangle contains the third side also. (Remember: 3 points will determine a plane) Always Sometimes Never True

Quiz Form B

Name ______________________

Class __________ Date __________ Score __________

Unit III - Fundamental Theorems
Part H - Theorems About Parallel Lines

Lesson 8 - Theorem 22: "If two lines are perpendicular to a third line, then the two lines are parallel to each other."

Lesson 9 - Theorem 23: "If two lines are parallel to a third line, then the two lines are parallel to each other."

Lesson 10 - Theorem 24: "If two parallel planes are cut by a third plane, then the two lines of intersection are parallel."

In Exercises 1 through 10, classify each statement as always, sometimes, or never true. (circle your choice)

1. If two planes are parallel, every line in one of the planes is parallel to the other plane. Always Sometimes Never True

2. In space, a line which intersects one of two parallel lines, intersects the other also. Always Sometimes Never True

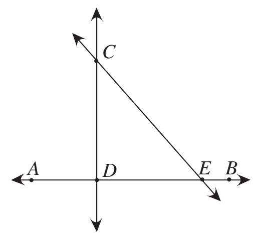
3. A line and a plane are parallel if they do not intersect. Always Sometimes Never True

4. If line ℓ is parallel to plane P, and plane Q contains line ℓ, and plane P intersects plane Q in line t, then line t is parallel to line ℓ. Always Sometimes Never True

Name ____________________________________

Use any of the definitions, postulates, theorems, and corollaries from our Geometry to give a reason for each conclusion in Exercises 13 through 17.

13. Given: $\overleftrightarrow{CD} \perp \overleftrightarrow{AB}$
$\overleftrightarrow{CE}$ intersects $\overleftrightarrow{AB}$

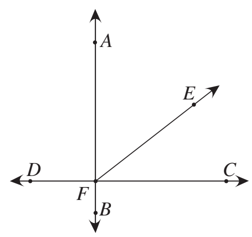


Conclusion: $\overleftrightarrow{CE}$ is not perpendicular to $\overleftrightarrow{AB}$

Reason: ____________________________________

____

14. Given: $\overleftrightarrow{CD} \perp \overleftrightarrow{AB}$

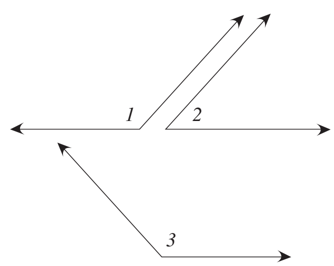


Conclusion: $\angle AFE$ and $\angle EFC$ are complementary angles

Reason: ____________________________________

____

15. Given: $\angle 1$ and $\angle 2$ are supplementary
$\angle 3$ and $\angle 2$ are supplementary

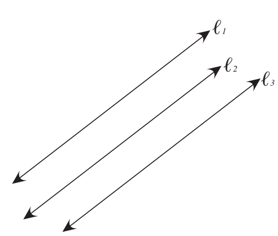


Conclusion: $\angle 1 \cong \angle 3$

Reason: ____________________________________

____

16. Given: $\ell_1 \parallel \ell_2$
$\ell_1 \parallel \ell_3$



Conclusion: $\ell_2 \parallel \ell_3$

Reason: ____________________________________

____

Name ______________________________

2. Given: collinear points, P, Q, R, and S
$\overline{PQ} \cong \overline{SR}$

Prove: $\overline{PR} \cong \overline{SQ}$

STATEMENT	REASON

Name ______________________________

In the figure to the right, eight angles are formed by two parallel lines cut by a transversal.
For each of Exercise, 25 through 30, find the measure of each of the eight angles using the information given.

25. $m\angle 5 = m\angle 6$; $m\angle 5 = m\angle 4$

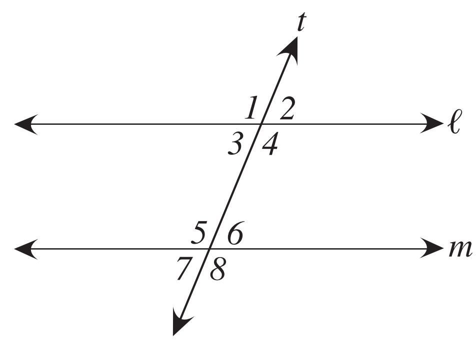
26. $m\angle 3 = m\angle 6$; $m\angle 5 + m\angle 4 = 240^{o}$

27. $2 \cdot m\angle 6 = m\angle 1$; $m\angle 2 + m\angle 7 = 120^{o}$

28. $m\angle 3 + m\angle 6 = 160^{o}$

29. $m\angle 1 + m\angle 7 = 180^{o}$; $m\angle 4 = 3 \cdot m\angle 6$

30. $m\angle 2 + m\angle 7 = 140^{o}$



	∠1	∠2	∠3	∠4	∠5	∠6	∠7	∠8
25.	____	____	____	____	____	____	____	____
26.	____	____	____	____	____	____	____	____
27.	____	____	____	____	____	____	____	____
28.	____	____	____	____	____	____	____	____
29.	____	____	____	____	____	____	____	____
30.	____	____	____	____	____	____	____	____

