Name: _____

Entering Geometry Additional Practice

The following are topics learned in algebra that will be helpful to review and practice prior to starting your year in Geometry.

Part 1: Angle Relationships

Lines *k* and *l*, shown at the right, are parallel. Use this to identify the angle relationships of the angles given below. Then, find the angle measure. The types of angle relationships are given.

Note: the measure of an angle might not be the same across all problems.
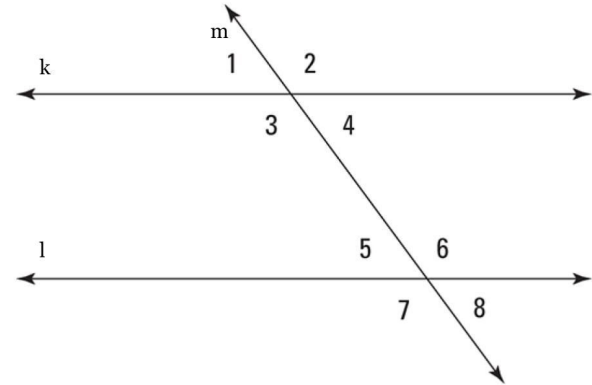
Example: Given that m∠1 is 63°, find m∠2.

Angle relationship: <u>supplementary angles</u>   m∠2 = <u>117°</u>   (180 - 63 = 117)

Angel Relationships. Choose one for each problem below.

vertical angles	supplementary angles	complementary angles
corresponding angles	alternate interior angles	alternate exterior angles

1. m∠2 is 117°	2. m∠5 is 48°
m∠6 = _____ Relationship: _____	m∠7 = _____ Relationship: _____
3. m∠5 is 55°	4. m∠7 is 130°
m∠4 = _____ Relationship: _____	m∠6 = _____ Relationship: _____

Solve for x, then find the angle measures.

Example 1:

m∠2 is (2x+16)°
m∠3 is (3x-26)°
2x+16 = 3x-26
x = 42
m∠2 = 100
m∠3 = 100

∠2 and ∠3 are vertical angles
Vertical angles are congruent (the same)
Solve for x
Plug in 42 for x

k

m

1 2

3 4

l

5 6

7 8
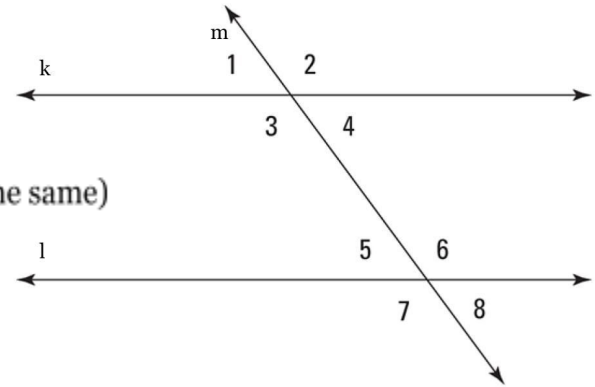
Example 2:

m∠6 is (x+100)°
m∠8 is (8x-1)°
(x+100) + (8x-1) = 180
9x+99 = 180
9x = 81
x = 9
m∠6 = 109
m∠8 = 71

∠6 and ∠8 are supplementary angles
Supplementary angles add up to 180°
Add angles together
Subtract 99
Divide by 9
Plug in 9 for x

5. m∠4 is (x+23)° and m∠5 is (2x-14)°	6. m∠5 is (x+6)° and m∠7 is (2x-48)°
x = _____ m∠4 = _____ m∠5 = _____	x = _____ m∠5 = _____ m∠7 = _____
7. m∠1 is (2x-96)° and m∠2 is (x+72)°	8. m∠2 is (7x-18)° and m∠7 is (5x+16)°
x = _____ m∠1 = _____ m∠2 = _____	x = _____ m∠2 = _____ m∠7 = _____

Part 2: Radical Operations

Use radical operations rules to simplify the following.
Example:

$$\sqrt{75} + \sqrt{27} - \sqrt{3} \times \sqrt{5}$$

$\sqrt{75} + \sqrt{27} - \sqrt{15}$	Order of operations: multiply
$5\sqrt{3} + \sqrt{27} - \sqrt{15}$	Simplify $\sqrt{75}$ to $5\sqrt{3}$
$5\sqrt{3} + 3\sqrt{3} - \sqrt{15}$	Simplify $\sqrt{27}$ to $3\sqrt{3}$
$8\sqrt{3} - \sqrt{15}$	Add like terms

Note: You cannot add $\sqrt{15}$ because there is a different number inside the radical

9. $\sqrt{15} \times \sqrt{12} - \sqrt{8} \times \sqrt{10}$	10. $\sqrt{98} + \sqrt{6} \times \sqrt{27}$
11. $\sqrt{8} \times \sqrt{12} - \sqrt{300}$	12. $\sqrt{6} \times \sqrt{24} + \sqrt{54} \times \sqrt{3}$

Use the Pythagorean Theorem and the given triangle to solve for the missing side. Leave your answer as a simplified radical.

Example:

Side c is 6 units long   Side c is the hypotenuse
Side b is 3 units long   Side b is an adjacent side
$a^2 + b^2 = c^2$ Pythagorean theorem
$a^2 + 3^2 = 6^2$ Plug in 6 for c and 3 for b
$a^2 + 9 = 36$ Simplify exponents
$a^2 = 27$ Subtract 9 from both sides
$a = 3\sqrt{3}$ Take square root of both sides
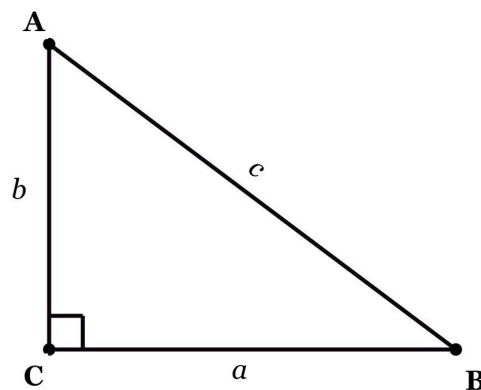
13. $a = 10$ and $b = 2\sqrt{29}$ c = _____	14. $b = 2\sqrt{7}$ and $c = 14$ a = _____
15. $a = 5$ and $c = 5\sqrt{5}$ b = _____	16. $a = x+2$, $b = x-3$, and $c = 25$ x = _____ a = _____ b = _____

Part 3: Point-Slope Form

There are three ways to write a linear equation:

1) Slope-Intercept Form

$y = mx + b$

2) Standard Form

$Ax + By = C$

3) Point Slope Form

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

$$y - y_1 = m\overset{\text{slope}}{(x - x_1)}$$

y-coordinate

x-coordinate

Here's an example:

A line goes through point (3, -4) with a slope of -2. Write the equation of this line in point-slope form.

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

$$y - (-4) = -2(x - 3) \quad \text{(Substitute the given values in)}$$

$$y + 4 = -2(x - 3) \quad \text{(Simplifty, if possible)}$$

Here's another example:

Use the given table to write the equation of this line in point-slope form.

x	y
3	11
5	16
7	21
9	26
11	31

+2   +5

+2   +5

+2   +5

+2   +5

$m = \frac{5}{2}$

**You can choose any point so there can be multiple answers here, but if you were to convert to Slope-Intercept Form or Standard Form, the equations would all be the same.

Now, plug in any point into: $y - y_1 = m(x - x_1)$

Possible Answers (all equivalent!):

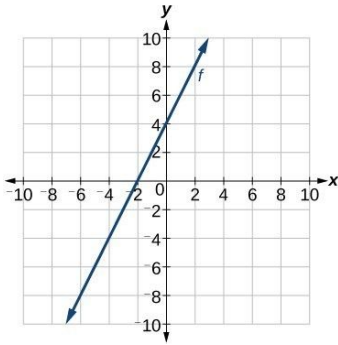$y - 11 = \frac{5}{2}(x - 3)$

$y - 16 = \frac{5}{2}(x - 5)$

$y - 21 = \frac{5}{2}(x - 7)$

$y - 26 = \frac{5}{2}(x - 9)$

$y - 31 = \frac{5}{2}(x - 11)$

Try some! Write each equation in Point-Slope Form.

17.	18. (3, 27) and (-2, 2)
19. (1, -26) and (-6, -40)	20. 	x	y	 	---	---	 	-4	-2	 	-2	-10	 	-1	-14	 	1	-22	 	2	-26	
21. $y = \frac{1}{3}x - 83$	22. m = -3 and (8,7) is on the line
23. $4x - 3y = 21$	24. $y = -\frac{4}{7}x + 6$