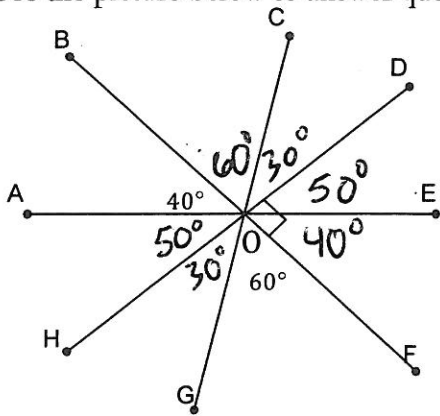


Unit 3 Geometry Honors Review

Use the picture below to answer questions 1 & 2.



1. $m\angle GOE = 100^\circ$

2. $m\angle EOD = 50^\circ$

From the figure, label the:

3. Corresponding Angles

1,5 / 2,6 / 3,7 / 4,8

4. Alternate Interior Angles

3,6 / 4,5

5. Consecutive Interior Angles

3,5 / 4,6

6. If Lines $l \parallel k$, and $m\angle 3 = 75$ find

a) $m\angle 1$

105°

b) $m\angle 5$

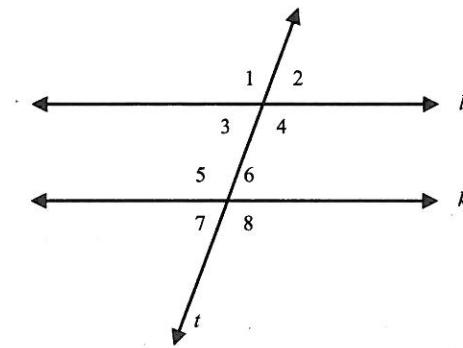
105°

c) $m\angle 6$

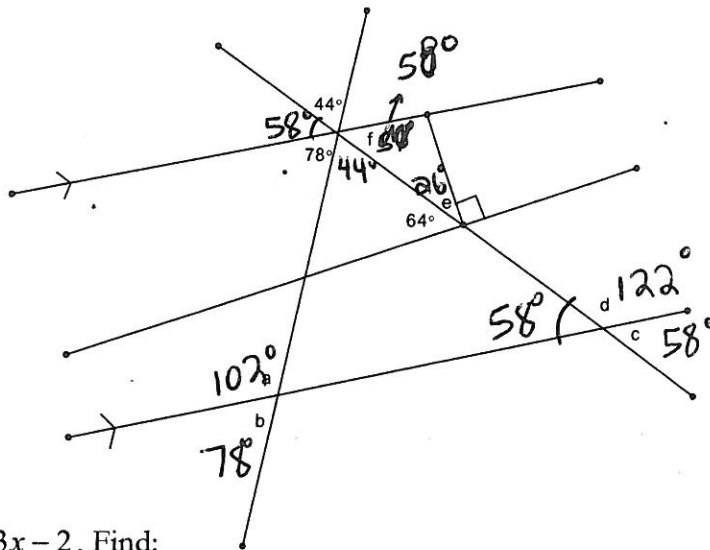
75°

d) $m\angle 7$

75°



7. Find each lettered angle measure.



8. Given the equation of the line $y = 3x - 2$, Find:

a) Slope of a parallel line

3

b) Slope of a perpendicular line

$-1/3$

Given the equation of the line $y = -7x + 3$, what is the... (4pts)

c) slope of a line parallel to that line?

-7

d) slope of a line perpendicular to that line?

$1/7$

9. Write the equation of the line that is perpendicular to $y = -\frac{1}{4}x + 8$ through the point (5, 3) in all 3 forms.

$m=4$

$y-3 = 4(x-5)$ point slope

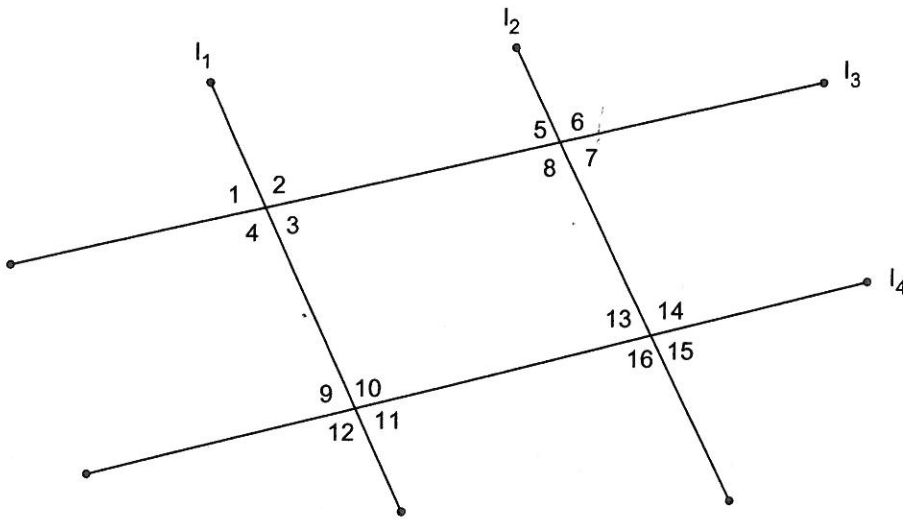
$y-3 = 4x-20$

$+3 \quad +3$

$y = 4x-17$ slope intercept

$-4x + y = -17$

$4x - y = 17$ Standard Form



Using the picture above and the information given to decide if the specified lines are parallel.

10. l1 and l2

$110 = m\angle 1 = 4x + 30$ } Vertical Angles

$110 = m\angle 3 = 6x - 10$ }

$150 = m\angle 5 = 3y + 30$ } Linear Pair

$30 = m\angle 8 = 2y - 50$ }

$4x + 30 = 6x - 10$

$40 = 2x$

$20 = x$

$3y + 30 + 2y - 50 = 180$

$5y - 20 = 180$

$5y = 200$

$y = 40$

Not Parallel.

11. l3 and l4

$80 = m\angle 5 = 5x + 5$ } Linear Pairs

$100 = m\angle 6 = 4x + 40$ }

$100 = m\angle 14 = 7y + 30$ } Vertical Angles

$100 = m\angle 16 = 5y + 50$ }

$5x + 5 + 4x + 40 = 180$

$9x + 45 = 180$

$\frac{9x}{9} = \frac{135}{9}$

$x = 15$

$7y + 30 = 5y + 50$

$2y = 20$

$y = 10$

Yes Parallel since corresponding angles are \cong

Solve the system of equations

12. $5x + 7y = 77$ $5x + 7y = 77$

$5x + 3y = 53 \rightarrow -5x - 3y = -53$

$x-1$

$5x + 7(6) = 77$

$5x + 42 = 77$

$5x = 35$

$x = 7$

$4y = 24$

$y = 6$

$(7, 6)$

13. $9x + 3y = 2$

$+ \quad -9x - y = 0$

$2y = 2$

$y = 1$

$9x + 3(1) = 2$

$9x + 3 = 2$

$9x = -1$

$(-\frac{1}{9}, 1)$

$x = -\frac{1}{9}$

14. Decide if the story below is an example of inductive or deductive reasoning. Explain your answer. Brenda has just been hired as a plumber's assistant. Her first task is to open all the water valves to release the pressure on the lines. She notices that the first four valves open by turning counterclockwise. She conjectures that all water valves open by turning counterclockwise.

Inductive Since she uses past examples to make a prediction about a pattern

15. Identify each statement as true or false for each of the following.

a) If corresponding angles are congruent, then the two lines cut by the transversal are parallel.

True

b) If lines are parallel and cut by a transversal, then alternate exterior angles are congruent.

True

c) A linear pair of angles are complementary.

False Supplementary.

d) Vertical angles are congruent.

True

e) Consecutive interior angles always add up to 180° .

False, only if the lines are parallel.

16. Think of each segment in the figure as part of a line.

a. Which line(s) appear perpendicular to \overleftrightarrow{AB} ?

~~AB~~, \overleftrightarrow{BD} , \overleftrightarrow{AC} , \overleftrightarrow{GA} , \overleftrightarrow{HB}

b. Which line(s) appear parallel to \overleftrightarrow{AB} ?

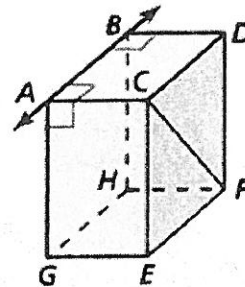
\overleftrightarrow{CD} , \overleftrightarrow{EF} , \overleftrightarrow{GH}

c. Which line(s) appear skew to \overleftrightarrow{AB} ?

\overleftrightarrow{GE} , \overleftrightarrow{HF} , \overleftrightarrow{CF}

d. Which plane(s) appear parallel to plane ABC?

plane EFG.



Write an equation of the line passing through the given point that is parallel to the given line. P.S. \rightarrow Point Slope S.I. \rightarrow Slope Intercept.

17. $A(3, -4), y = -x + 8$

18. $A(-6, 5), y = \frac{1}{2}x - 7$

19. $A(2, 0), y = 3x - 5$

20. $A(3, -1), y = \frac{1}{3}x + 10$

17) $y + 4 = -1(x - 3)$ P.S.
 $y + 4 = -x + 3$
 $y = -x - 1$ S.I.

19) $y - 0 = 3(x - 2)$ P.S.
 $y = 3x - 6$ S.I.

18) $y - 5 = \frac{1}{2}(x + 6)$ P.S.
 $y - 5 = \frac{1}{2}x + 3$
 $y = \frac{1}{2}x + 8$ S.I.

20) $y + 1 = \frac{1}{3}(x - 3)$ P.S.
 $y + 1 = \frac{1}{3}x - 1$
 $y = \frac{1}{3}x - 2$ S.I.

Write an equation of the line passing through the given point that is perpendicular to the given line. P.S. → Point Slope / Slope Intercept → S.I.

21. A(6, -1), $y = -2x + 8$

22. A(0, 3), $y = -\frac{1}{2}x - 6$

23. A(8, 2), $y = 4x - 7$

24. A(-1, 5), $y = \frac{1}{7}x + 4$

More Work on Back of AX
Find the distance from point A to the given line.

25. A(2, -1), $y = x + 4$

26. A(-2, 3), $y = \frac{1}{2}x + 1$

21) $y + 1 = \frac{1}{2}(x - 6)$ P.S.

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

$y = \frac{1}{2}x - 4$ S.I.

22) $y - 3 = 2(x - 0)$ P.S.

$y - 3 = 2x$

$y = 2x + 3$ S.I.

23) $y - 2 = -\frac{1}{4}(x - 8)$ P.S.

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

$y = -\frac{1}{4}x + 4$ S.I.

24) $y - 5 = -7(x + 1)$ P.S.

$y - 5 = -7x - 7$

$y = -7x - 2$ S.I.

Line \perp to this line through A(2, -1)

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

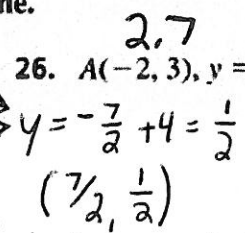
$y = x - 3$ ✓

See where they intersect

$y = y$

$x - 3 = -x + 4$

$2x = 7 \rightarrow x = \frac{7}{2}$



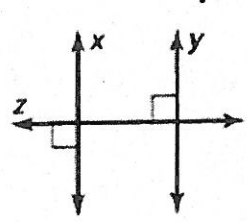
Find distance between $(\frac{7}{2}, \frac{1}{2})$ and $(2, -1)$

$D = \frac{3\sqrt{2}}{2}$

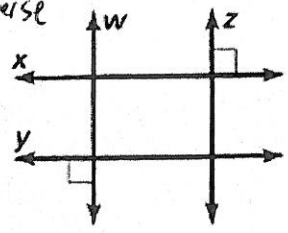
27. Find the measure of angle BAC.

Work on Back

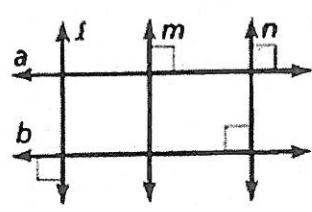
28. Determine which lines, if any, must be parallel. Explain your reasoning.



~~XIII~~ → Alt Ext Converse
XIII



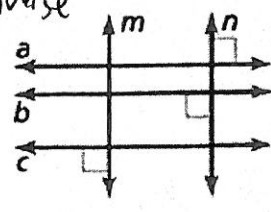
None



$a \parallel b \rightarrow$ Alt. Ext. Converse

$m \parallel n \rightarrow$ corresponding converse

$l \parallel n \rightarrow$ Alt. Ext. Converse



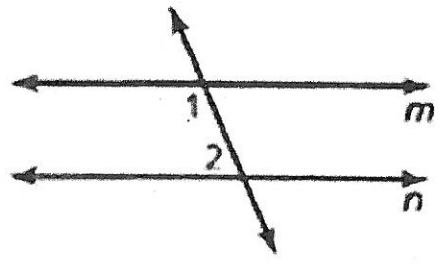
$a \parallel b \rightarrow$ Alt. Ext. Converse

$m \parallel l \rightarrow$ if $m \parallel n$ & $l \parallel n$, then $m \parallel l$.

Answers May Vary S | R

29. Given $m\angle 1 = 115^\circ, m\angle 2 = 65^\circ$

Prove $m \parallel n$

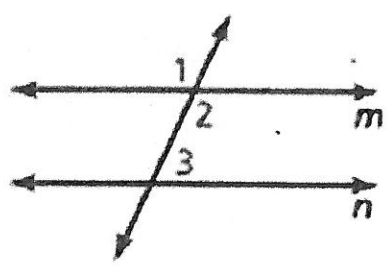


$m\angle 1 = 115$
 $m\angle 2 = 65$
 $\angle 1 \& \angle 2$ are supp.
 $m \parallel n$

Given
 Def. of Supplementary Angles
 consecutive Int. Angles Converse.

Given $\angle 1$ and $\angle 3$ are supplementary.

Prove $m \parallel n$

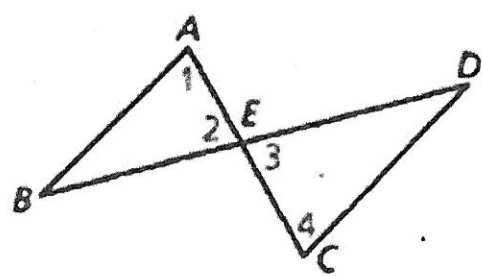


$\angle 1 \& \angle 3$ are supp.
 $m\angle 1 + m\angle 3 = 180^\circ$
 $\angle 1 \cong \angle 2$
 $m\angle 2 + m\angle 3 = 180^\circ$
 $m \parallel n$

Given
 Def of Supp.
 Vertical Angles Thm
 Substitution
 consecutive Int. Angles Converse

Given $\angle 1 \cong \angle 2, \angle 3 \cong \angle 4$

Prove $\overline{AB} \parallel \overline{CD}$

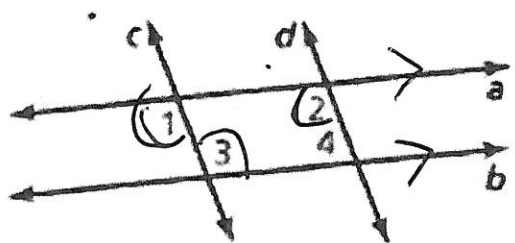


$\angle 1 \cong \angle 2, \angle 3 \cong \angle 4$
 $\angle 2 \cong \angle 3$
 $\angle 1 \cong \angle 3$
 ~~$\angle 1 \cong \angle 4$~~
 $\angle 1 \cong \angle 4$
 $\overline{AB} \parallel \overline{CD}$

Given
 Vertical Angles Thm
 Substitution
 Substitution
 Alt. Int. Angles Converse.

Given $a \parallel b, \angle 2 \cong \angle 3$

Prove $c \parallel d$



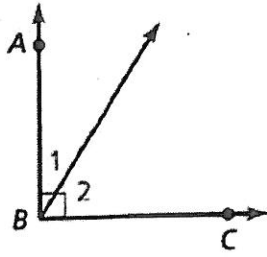
$a \parallel b, \angle 2 \cong \angle 3$
 $\angle 1 \cong \angle 3$
 $\angle 2 \cong \angle 1$
 $c \parallel d$

Given
 Alt. Int. Angles Theorem
 Substitution
 Corresponding Angles Converse.

30. If two sides of two adjacent acute angles are perpendicular, then the angles are complementary.

Given $\overline{BA} \perp \overline{BC}$

Prove $\angle 1$ and $\angle 2$ are complementary.



S	R
---	---

$\overline{BA} \perp \overline{BC}$

Given

$m\angle ABC = 90^\circ$

Definition of Perpendicular Lines

$m\angle ABC = m\angle 1 + m\angle 2$

Angle Addition Postulate

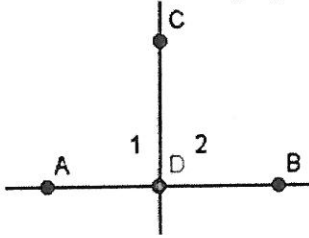
$m\angle 1 + m\angle 2 = 90^\circ$

Transitive Property

$\angle 1$ & $\angle 2$ are complementary

Definition of Perpendicular Lines.

31. Prove the Linear Pair Perpendicular Theorem. If two lines intersect to form a linear pair of congruent angles, then the lines are perpendicular. Given: $\angle 1 \cong \angle 2$.



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$\angle 1 \cong \angle 2$

Given

$m\angle 1 + m\angle 2 = 180$

Linear Pair Postulate

$m\angle 2 + m\angle 2 = 180$

Substitution

$2m\angle 2 = 180$

Simplify

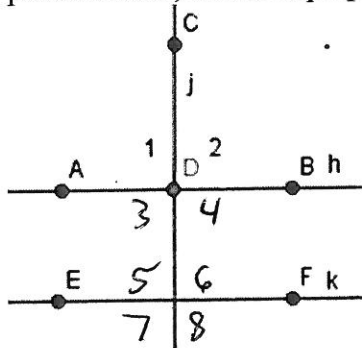
$m\angle 2 = 90^\circ$

Division POE

$AB \perp CD$

Def of Perpendicular Lines

32. Prove the Perpendicular Transversal Theorem. In a plane, if a transversal is perpendicular to one of the two parallel lines, then it is perpendicular to the other line. Given $h \parallel k$ and $j \perp h$, prove $j \perp k$.



S	R
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$h \parallel k$

Given

$j \perp h$

$m\angle 1 = 90^\circ$

Def of Perpendicular Lines

$\angle 1 \cong \angle 5$

Corresponding Angles Theorem

$m\angle 5 = 90^\circ$

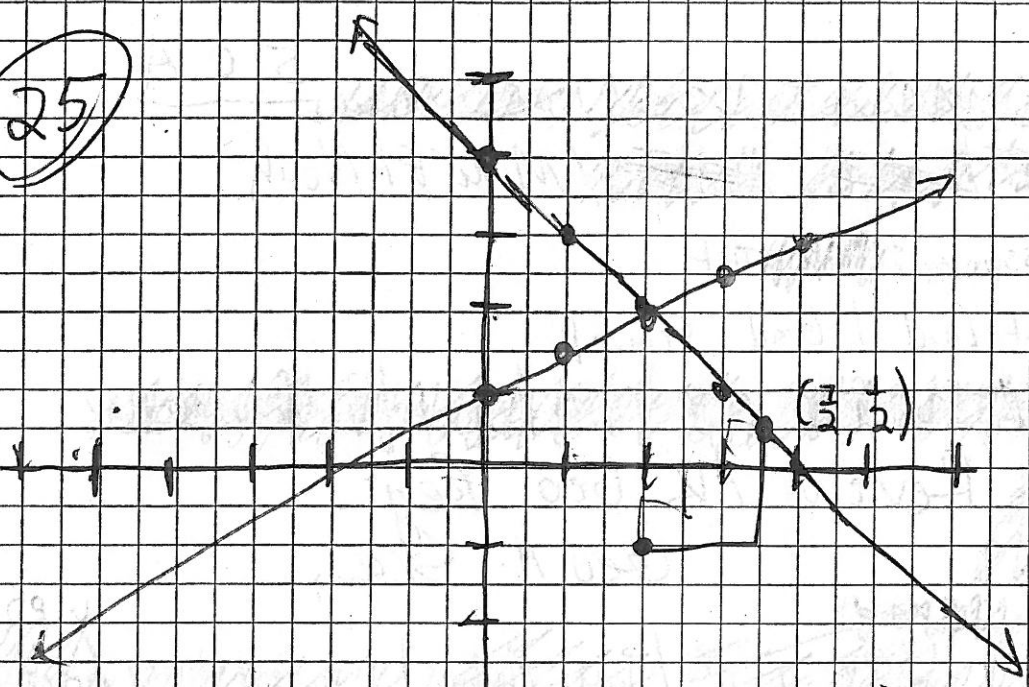
Substitution

$j \perp k$

Definition of Perpendicular.

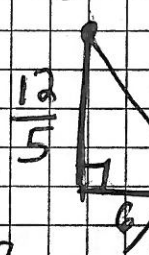
25

7



$$\left(-\frac{10}{5}, \frac{15}{5}\right)$$

$$(-2, 3)$$



$$\left(\frac{12}{5}\right)^2 + \left(\frac{6}{5}\right)^2 = D^2$$

$$5.76 + 1.44 = D^2$$

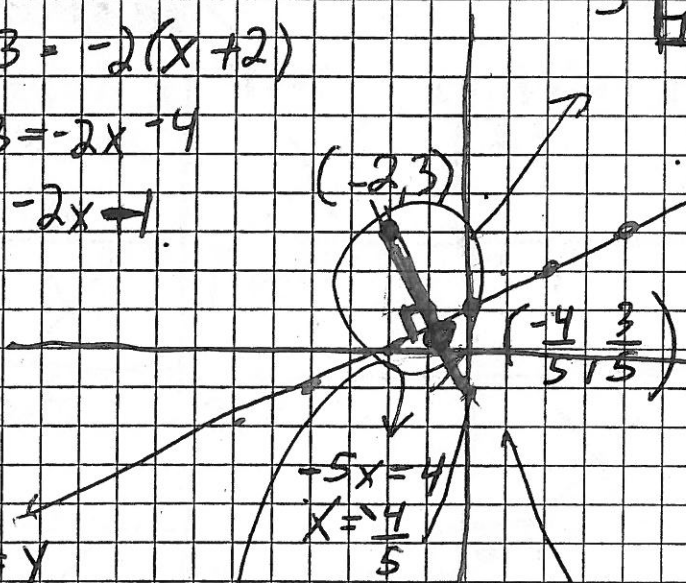
$$7.2 = D^2$$

$$2.7 = D$$

26

① $y - 3 = -2(x + 2)$
 $y - 3 = -2x - 4$
 $y = -2x - 1$

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



$$-5x = 4$$

$$x = -\frac{4}{5}$$

$$y = -2\left(-\frac{4}{5}\right) - 1$$

$$y = \frac{8}{5} - \frac{5}{5} = \frac{3}{5}$$

2.7

②

$$y = y$$

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

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

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

5/2

$$27x^2 + 11x + 30 + 20x + 24y = 180$$

$$x^2 + 31x + 24y = 150$$

x3

$$20x + 24y + 10x + 21y = 180$$

$$30x + 45y = 180$$

$$\begin{array}{r} 30x + 45y = 180 \\ \underline{5 \quad 5 \quad 5} \\ 6x + 9y = 36 \end{array}$$

x8

LCM of 9 & 24

$$9 \Rightarrow (3 \cdot 3) \times 2 \times 2 \times 2 = 72$$

$$24 \Rightarrow (2 \cdot 2 \cdot 2 \cdot 3) \times 3 = 72$$

$$3x^2 + 9x + 72y = 450$$

$$-48x - 72y = -288$$

$$\underline{3x^2 + 45x = 162}$$

$$\begin{array}{r} 3x^2 + 45x = 162 \\ \underline{3 \quad 3 \quad 3} \\ x^2 + 15x = 54 \end{array}$$

continued on next page

$$x^2 + 15x - 54 = 0$$

$$(x-9)(x+6) = 0$$

$$x = 9 \text{ or } 6$$

$$6(9) + 9y = 36$$

$$+36 - 54$$

$$9y = -18$$

$$y = -2$$

$$6(6) + 9y = 36$$

$$-36 - 36$$

$$9y = 0$$

$$y = 0$$

Doesn't make sense \rightarrow TWO Solutions $(6,0)$

WLBAC = 72

(9)

27 (cont.)

$$x^2 + 15x - 54 = 0$$

$$(x+18)(x-3) = 0$$

$$x = 3 \text{ or } -18$$

$$m\angle BAC = x^2 + 11x + 30$$

$$\swarrow x=3$$

$$3^2 + 11(3) + 30$$

$$9 + 33 + 30$$

$$\textcircled{72^\circ}$$

$$\searrow x=-18$$

$$(-18)^2 + 11(-18) + 30$$

$$324 - 198 + 30$$

$$\textcircled{156^\circ}$$

Two possible $m\angle BAC$

$$x^2 + 9x = 10x + 10y$$

$$x^2 - x - 10y = 0$$

$$+ \quad -5x + 10y = 0 \quad \leftarrow \quad -5x + 10y = 0$$

$$\begin{array}{r} 5x + 20y = 10x + 10y \\ -10x - 10y \quad -10x - 10y \end{array}$$

$$x^2 - 6x = 0$$

$$x(x-6) = 0$$

$$x = 0 \text{ or } 6$$

Not a solution because it implies $m\angle BAC = 0$.

$$\begin{aligned} m\angle BAC &= x^2 + 9x \\ &6^2 + 9(6) \\ &36 + 54 \end{aligned}$$

$$\textcircled{90^\circ}$$