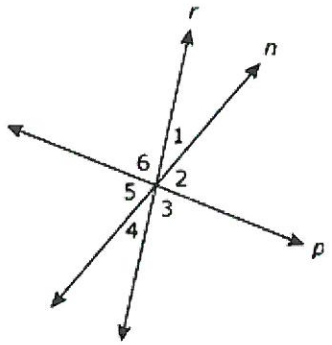
Unit 2 Review

1. The figure shows lines r, n, and p intersecting to form angles numbered 1, 2, 3, 4, 5, and 6. All three lines lie in the same plane.



not to scale

Based on the figure, which of the individual statements would provide enough information to conclude that line r is perpendicular to line p?

Select **all** that apply.

- ☐ A. $m\angle 2 = 90^\circ$
- ☑ B. $m\angle 6 = 90^\circ$
- ☐ C. $m\angle 3 = m\angle 6$
- ☐ D. $m\angle 1 + m\angle 6 = 90^\circ$
- ☐ E. $m\angle 3 + m\angle 4 = 90^\circ$
- ☑ F. $m\angle 4 + m\angle 5 = 90^\circ$

2. Find the length and midpoint of each segment given the endpoints.

A(-6,1) B(0,5)

$\sqrt{4^2+6^2}$

$\sqrt{16+36}$

$\sqrt{52}$ ≈ 7.2

$2\sqrt{13}$

C(-5, 1) D(-3, 8)

2^2+7^2

$4+49$

$\sqrt{53}$

≈ 7.3

E(2,7) F(4, -2)

2^2+9^2

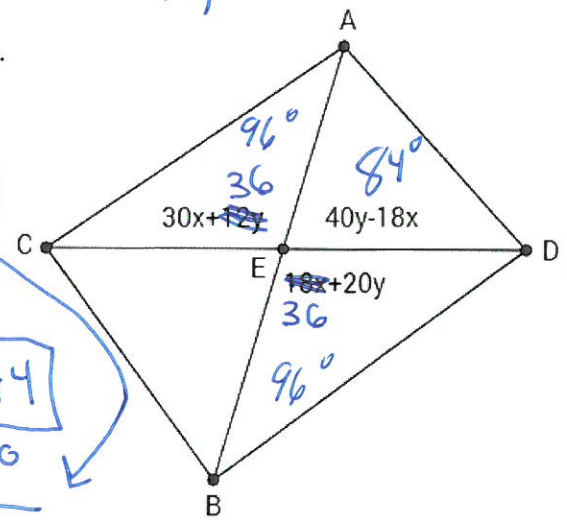
$4+81$

$\sqrt{85}$

≈ 9.2

Midpoints: $(-3, 3)$ $(-4, 4.5)$ $(3, 2.5)$

3. Find x and y (use the vertical angles theorem and linear pair postulate).



$30x+36 = 36+24$

$\boxed{30x-20y=0}$ $\times(+2)$

$30x+36+40y-18x=180$

$\boxed{12x+40y=144}$

$+60x-40y=0$

$72x=144$

$x=2$

$30(2)-20y=0$

$60=20y$

$3=y$

$(2,3)$

~~$48x-40y=36$~~

~~$60x+40y=0$~~

~~$-12x=-36$~~

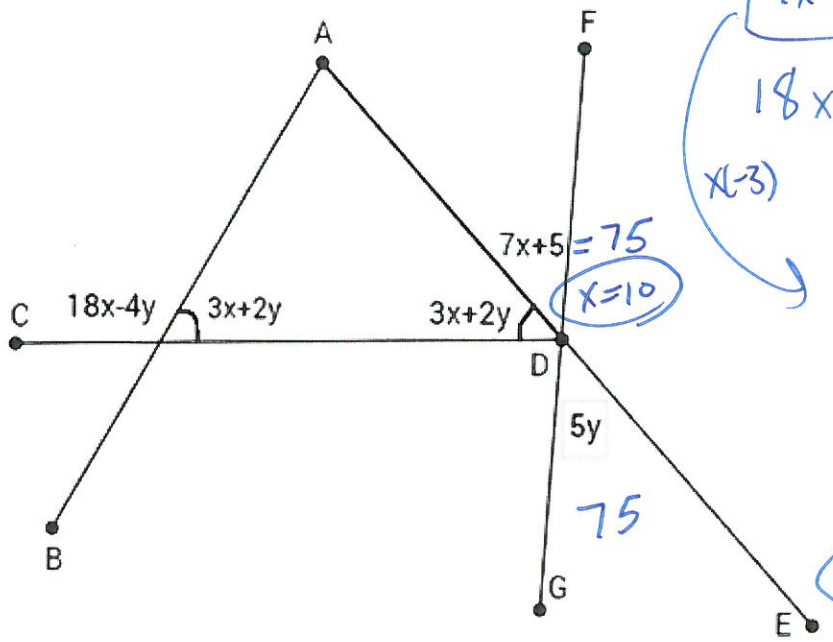
~~$x=3$~~

~~$30(3)-20y=0$~~

~~$90=20y$~~

~~$4.5=y$~~

4. Find x and y.



$7x+5=5y$

$\boxed{7x-5y=-5}$

$18x-4y+3x+2y=180^\circ$

$x(-3)$ $\quad 21x-2y=180$

$-21x+15y=15$

$13y=195$

$y=15$

$7x+5=75$

$x=10$

75

$(10,15)$

5. Write the converse and inverse of each statement. Then say if each statement is true or false. If false, provide a counter example.

If angles are vertical angles, then they are congruent. True

Converse: If angles are $\cong$, then they are Vertical angles.

False $\angle 70^\circ$ $\angle 70^\circ$

Inverse: If angles are not vertical angles, then they are not $\cong$.

False

If an angle is a right angle, then it is 90 degrees.

Converse: If an angle is 90°, then it is a right angle.

True

Inverse: If an angle is Not a right angle, then it is not 90°.

True

6. Solve for x by writing algebraic proofs.

$5(4x-11) = 8x - 7$ Given

$20x - 55 = 8x - 7$ Distributive Prop.

$-8x \quad -8x$

$12x - 55 = -7$ Sub. POE

$+55 \quad +55$

$12x = 48$ Add. POE

$x = 4$ Div. POE

$4(6x - 2) + 8 = 4x+3$ Given

$24x - 8 + 8 = 4x + 3$ Dist. Prop

$24x = 4x + 3$ combine Like Terms

$20x = 3$ Sub. POE

$x = 3/20$ Div. POE

7. Solve each system by any method.

$y = -3x + 9$

$y = 5x + 33$

$-3x + 9 = 5x + 33$

$-24 = 8x$

$-3 = x$

$y = -3(-3) + 9$

$y = 18$

$(-3, 18)$

$12x + 3y = 18$

$-3(4x - 5y = -102)$

$-12x + 15y = 306$

$\frac{18y}{18} = \frac{324}{18}$

$y = 18$

$(-3, 18)$

$4x - 5(18) = -102$

$4x = -12$

$x = -3$

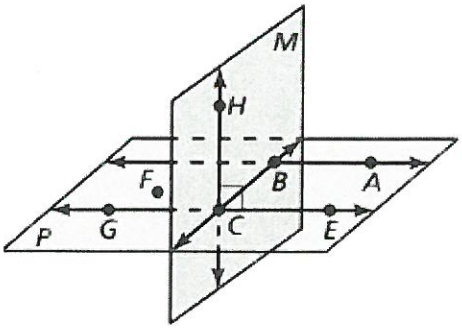
8. **Given** $\angle 1$ and $\angle 2$ are supplementary.
$\angle 3$ and $\angle 4$ are supplementary.
$\angle 1 \cong \angle 4$

Prove $\angle 2 \cong \angle 3$

STATEMENTS	REASONS
1. $\angle 1$ and $\angle 2$ are supplementary. $\angle 3$ and $\angle 4$ are supplementary. $\angle 1 \cong \angle 4$	1. Given
2. $m\angle 1 + m\angle 2 = 180°$, $m\angle 3 + m\angle 4 = 180°$	2. Def. of Supplementary
3. $m\angle 1 + m\angle 2$ = $m\angle 3 + m\angle 4$	3. Transitive Property of Equality
4. $m\angle 1 = m\angle 4$	4. Definition of congruent angles
5. $m\angle 1 + m\angle 2$ = $m\angle 3 + m\angle 1$	5. Substitution Property of Equality
6. $m\angle 2 = m\angle 3$	6. Subtraction POE
7. $\angle 2 \cong \angle 3$	7. Definition of congruent angles

9. Determine if the statement is true or false.

In the figure shown, $\overleftrightarrow{CF}$ intersects $\overleftrightarrow{AD}$ and $\overleftrightarrow{EH}$ at points B and F, respectively.



$\overleftrightarrow{GE} \perp$ plane M True

Points G, F, and B are coplanar True

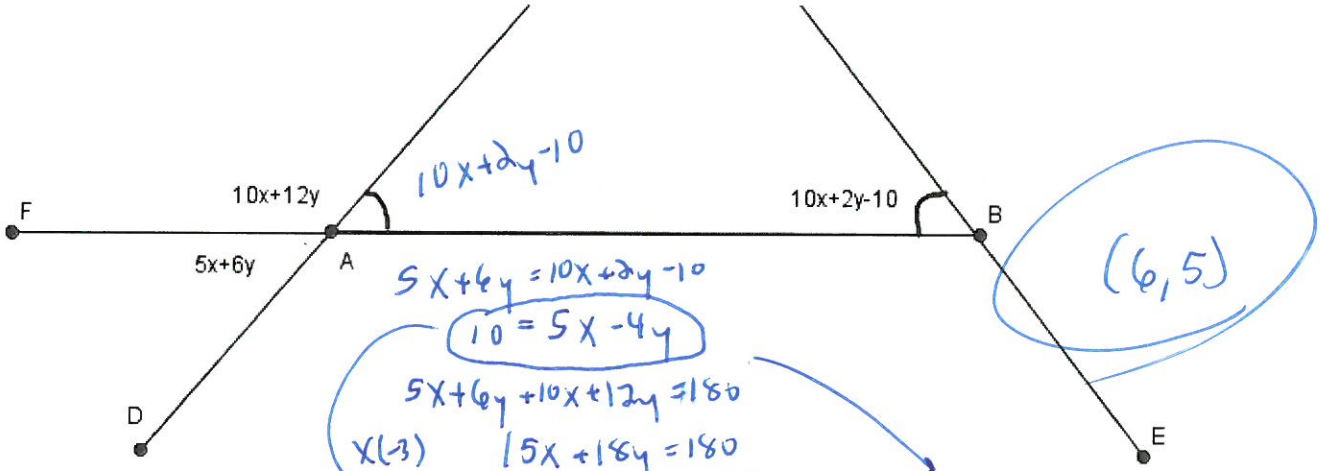
Planes M and P intersect at $\overleftrightarrow{AB}$ False

↳ at $\overleftrightarrow{BC}$

$\overleftrightarrow{FG}$ lies in plane P True

$\overleftrightarrow{EB}$ intersects $\overleftrightarrow{AB}$ at point B True

10. Find x and y.



$5x+6y = 10x+2y-10$

$10 = 5x-4y$

$5x+6y+10x+12y=180$

$x(-3)$ $15x+18y=180$

$-15x+12y=-30$

$30y=150$

$y=5$

$10=5x-4(5)$

$\cancel{30=5x}$

$6=x$

$(6,5)$

11. If you make a prediction or conjecture based of a few examples, what type of reasoning is that?

Inductive

12. If you prove something using facts, definitions or theorems, what type of reasoning is that?

Deductive.