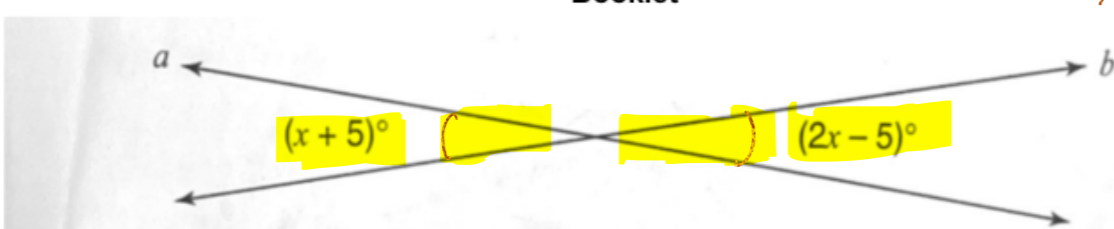




Solutions!
Geometry #7: Special Pairs of Angles
Booklet



$$x+5 = 2x-5$$

$$10 = x$$

1. In the accompanying diagram, line a intersects line b . What is the value of x ?

90°

2. The measures of two complementary angles are represented by $3x+15$ and $2x-10$. What is the value of x ?

- (1) 17 (2) 19 (3) 35 (4) 37

$$3x+15 + 2x-10 = 90$$

$$5x+5 = 90$$

3. What is the supplement of an angle whose measure is represented by $3x$?

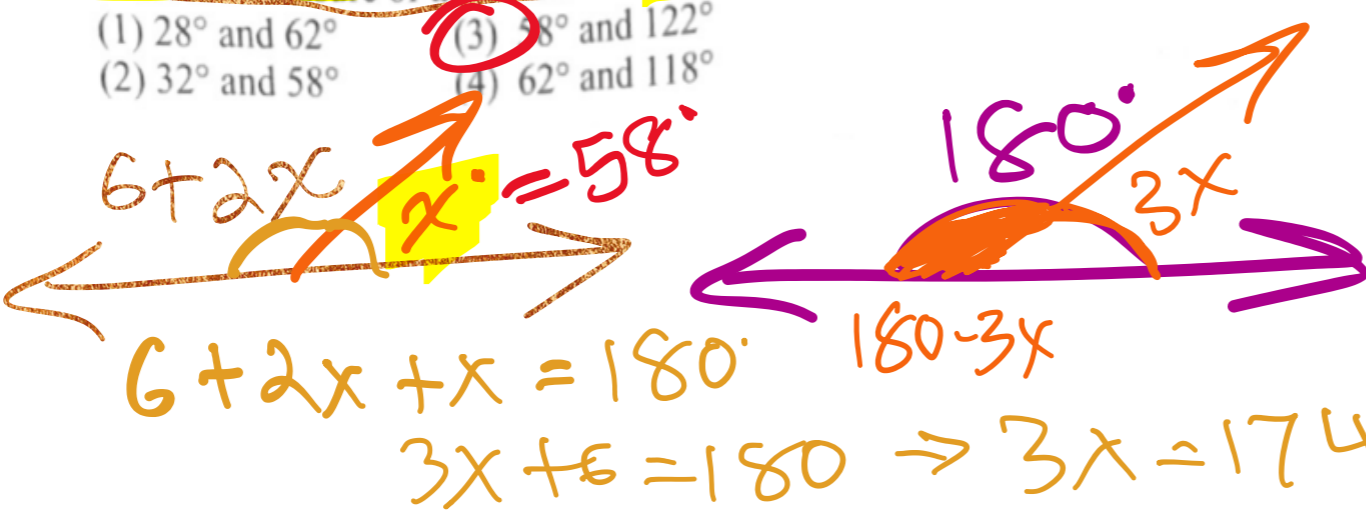
- (1) $90-3x$ (2) $3x-90$ (3) $180-3x$ (4) $3x-180$

$$5x = 85$$

$$x = 17$$

4. In two supplementary angles, the measure of one angle is 6 more than twice the measure of the other. The measures of these two angles are

- (1) 28° and 62° (2) 32° and 58° (3) 8° and 122° (4) 62° and 118°



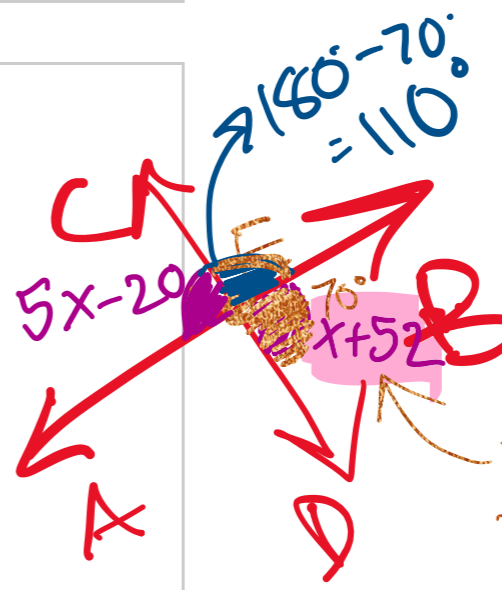
$$6+2x + x = 180$$

$$3x+6 = 180 \rightarrow 3x = 174 \rightarrow x = 58$$

5. \overline{AB} and \overline{CD} intersect at E . If $m\angle AEC = 5x-20$ and $m\angle BED = x+52$, find $m\angle CEB$.

110°

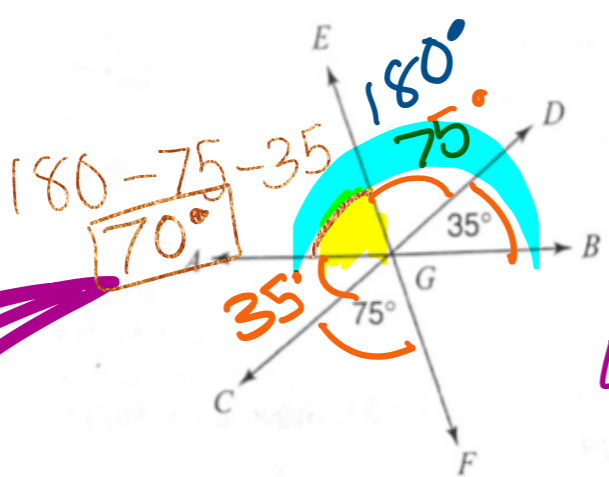
6. If the measure of an angle exceeds four times the measure of its complement by 25, what is the measure of the angle?



$$5x-20 = x+52$$

$$4x = 72$$

$$x = 18$$



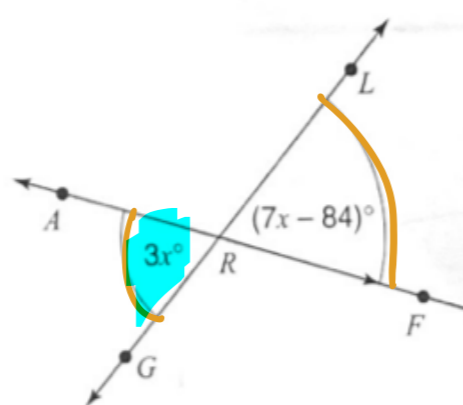
$$4(90-x) + 25 = x$$

$$360 - 4x + 25 = x$$

$$385 = 5x$$

$$x = 77$$

7. In the accompanying diagram, \overline{AB} , \overline{CD} , and \overline{EF} intersect at G . Find $m\angle AGE$.



8. In the accompanying diagram, \overline{AF} and \overline{LG} intersect at R . Find $m\angle ARG$.

$$3x = 7x - 84$$

$$84 = 4x$$

$$21 = x$$

$$21 \cdot 3 = 63$$

9. Two vertical angles are complementary. Find the measure in each angle.

10. The measure of the greater of two supplementary angles is five times the measure of the smaller angle. What is the measure of the larger angle?



$$5x + x = 180$$

$$6x = 180 \rightarrow x = 30$$

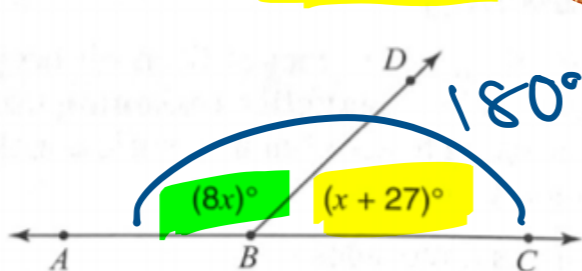
$$5(30) = 150$$

$$x + x = 90$$

$$2x = 90$$

$$x = 45$$

11. In the accompanying diagram, \overline{AB} and \overline{CD} intersect at E , $m\angle AEC = 5x+12$, and $m\angle DEB = 8x-3$. Find $m\angle AED$.



$$8x-3 = 5x+12$$

$$3x = 15 \rightarrow x = 5$$

$$5(5)+12 = 37$$

Supplementary!

12. In the accompanying diagram, angles ABD and CBD form a linear pair. If $m\angle ABD = 8x$, and $m\angle CBD = x+27$, find x .

$$8x + x + 27 = 180$$

$$9x = 153$$

$$x = 17$$