

1. Determine whether each statement is always, sometimes or never true.

- a. Two complementary angles are also adjacent angles. (S)
- b. Two angles of a linear pair are adjacent angles. (A)
- c. Vertical angles are adjacent angles. (N) adjacent \nexists s (common side)
- d. An acute angle and obtuse angle are complementary. (N)
- e. An angle and its supplement are congruent. (S)

2. The measures of 2 complementary angles are in the ratio of 4:1. What is the measure of the smaller angle?

let $4x = \text{meas. of one } \angle$
 $x = \text{meas. of smaller } \angle$
 $4x + x = 90$
 $5x = 90$
 $x = 18$

18° smaller \angle
 72°

ck
 $\frac{72}{18} = \frac{4}{1}$
 $72 + 18 = 90 \checkmark$

3. The difference between 2 supplementary angles is 38. Find the measure of the larger angle.

let $x = \text{one } \angle$
 $180 - x = \text{the supplement}$
 $180 - x - x = 38$
 $180 - 2x = 38$

$142 = 2x$
 $71 = x$

$71^\circ, 109^\circ$ larger \angle

ck
 $109 - 71 = 38 \checkmark$
 $109 + 71 = 180 \checkmark$

4. The difference in the measures of 2 complementary angles is 39° . Find the measures of the 2 angles.

let $x = \text{one } \angle$
 $90 - x = \text{measure of complement}$
 $90 - x - x = 39$
 $90 - 2x = 39$

$51 = 2x$
 $25.5 = x$

25.5°
 64.5°

ck
 $64.5 - 25.5 = 39$
 $64.5 + 25.5 = 90$

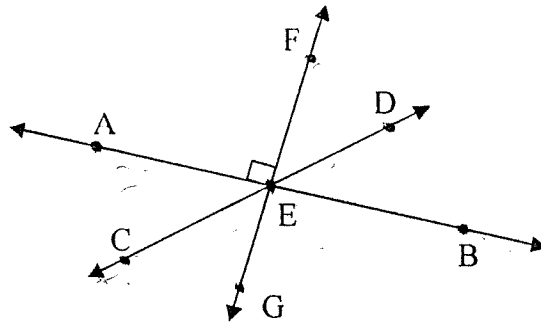
5. The measure of the supplement of an angle is 30 more than twice the measure of the angle. Find the measures of the angles.

let $x = \text{meas. of } \angle$
 $2x + 30 = \text{meas. of suppl.}$
 $2x + 30 + x = 180$
 $3x = 150$
 $x = 50$

50°
 130°

ck
 $50 + 130 = 180 \checkmark$
 $2(50) + 30 = 130 \checkmark$

6. Use the diagram to find each.



a. $m\angle AEC = 2x + 30$, $m\angle DEB = 3x + 10$. Find $m\angle FED$ and $m\angle CEB$.

$$2x + 30 = 3x + 10$$

$$20 = x$$

$$m\angle AEC = 2(20) + 30 = 70$$

$$m\angle DEB = 3(20) + 10 = 70$$

$$m\angle FED = 90 - 70 = 20^\circ$$

$$m\angle CEB = 90 + 20 = 110^\circ$$

b. $m\angle AEC = 2x + 7$, $m\angle BEC = 5x - 2$. Find $m\angle DEB$ and $m\angle FED$.

$$2x + 7 + 5x - 2 = 180$$

$$7x + 5 = 180$$

$$7x = 175$$

$$x = 25$$

$$m\angle AEC = m\angle DEB = 2(25) + 7$$

$$m\angle DEB = 57^\circ$$

$$m\angle FED = 90 - 57 = 33^\circ$$

c. $m\angle AEC = 12x + 4$, $m\angle GEC = 6x + 14$. Find $m\angle DEB$ and $m\angle FED$.

$$12x + 4 + 6x + 14 = 90$$

$$18x + 18 = 90$$

$$18x = 72$$

$$x = 4$$

$$m\angle AEC = m\angle DEB$$

$$= 12(4) + 4$$

$$= 52^\circ$$

$$m\angle FED = 90 - 52 = 38^\circ$$

d. $m\angle AEC = 3x + 5$, $m\angle DEF = 2x - 10$. Find $m\angle DEF$ and $m\angle DEB$.

$$3x + 5 + 2x - 10 = 90$$

$$5x - 5 = 90$$

$$5x = 95$$

$$x = 19$$

$$m\angle DEF = 2(19) - 10$$

$$= 28^\circ$$

$$m\angle DEB = 90 - 28 = 62^\circ$$