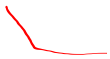
TYPES OF ANGLES: Sketch:

1. Acute: Acute angles have measures between 0° and 90°.

2. Right: A right angle has measure equal to 90°.

3. Obtuse: Obtuse angles have measures between 90° and 180°.



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SPECIAL PAIRS OF ANGLES:

1. Complementary Angles: Pair of angles whose sum of measures equals 90°.

40° and 50° angles are complementary angles because 40° + 50° = 90°.

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Example: A 40° angle is called the complement of the 50° angle.

Similarly, the 50° angle is the complement of the 40° angle.

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Practice: Find the **complement** of each angle.

a) 35° b) 48° c) 12°

55° 42° 78°

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2. Supplementary Angle: Pair of angles whose sum of measures equals 180°.

60° and 120° angles are supplementary angles because 60° + 120° = 180°.

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Example: A 60° angle is called the supplement of the 120° angle.

Similarly, the 120° angle is the supplement of the 60° angle.

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Practice: Find the **supplement** of each angle.

a) 40° 140° b) 126° 54° c) ~~72°~~ 108°

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Can you think of a way to remember the difference between complementary and supplementary angles?

C S

90° 180°

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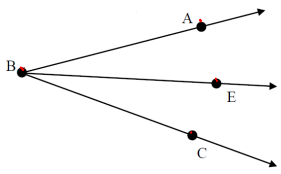
3. Angle Bisector: A ray (or line or segment) that divides an angle into two congruent angles (two angles with equal measure).

$\overrightarrow{BE}$ is an angle bisector

$\angle ABE \cong \angle EBC$ so $m\angle ABE = m\angle EBC$



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Practice:

1. Can two supplementary angles both be obtuse angles? NO Acute angles? NO

Ex. $91 + 91 = 182$ Ex. $89 + 89 = 178$

2. Can two supplementary angles both be right angles? Why?

yes, $90 + 90 = 180°$

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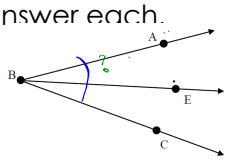
3. Refer to the diagram to answer each.

$\overrightarrow{BE}$ is an angle bisector.



a) If m∠ABE = 40°, find m∠EBC. 40°

b) If m∠ABC = 70°, find m∠ABE. 35°

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4. ∠1 and ∠2 are complementary. Solve for x and the measure of both angles.

$\angle 1 = 5x + 2 = 5(12) + 2 = 62°$

$\angle 2 = 2x + 4 \quad 2(12) + 4 = 28°$

$(5x + 2) + (2x + 4) = 90$

$7x + 6 = 90$

$-6 \quad -6$

$\frac{7x}{7} = \frac{84}{7}$

$x = 12$

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5. $\angle 1$ and $\angle 2$ are complementary. Solve for x and the measure of both angles.

$\angle 1 = 12x + 4$ $12(4)+4 = 52$

$\angle 2 = 9x + 2$ $9(4)+2 = 38^\circ$

$12x+4+9x+2=90$

$21x+6=90$

$-6 \quad -6$

$\frac{21x}{21} = \frac{84}{21}$

$x = 4$

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6. One of two complementary angles is 16 degrees less than its complement. Find the measure of both angles.

$x = ?$

$\angle 1 = x - 16$ 37°

$\angle 2 = x$ 53°

$x - 16 + x = 90$

$2x - 16 = 90$

$+16 \quad +16$

$\frac{2x}{2} = \frac{106}{2}$ $x = 53^\circ$

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7. One of two complementary angles is 36° greater than its complement. Find the measure of both angles.

$= 90$

$\angle 1 = x + 36$

$\angle 2 = x$

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8. One of two complementary angles is 57° greater than twice its complement. Find the measure of both angles.

$\angle 1 = 2x + 57$ $= 90$

$\angle 2 = x = 11°$ $= 2(11) + 57$

$22 + 57 = 79°$

$2x + x + 57 = 90$

$3x + 57 = 90$

$-57 \quad -57$

$\frac{3x}{3} = \frac{33}{3}$

$x = 11$

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9. One of two supplementary angles is 98° greater than its supplement. Find the measure of both angles. $= 180°$

$\angle 1 = x + 98$ $41 + 98 = 139°$

$\angle 2 = x = 41°$

$x + 98 + x = 180°$

$2x + 98 = 180$

$-98 \quad -98$

$x = 41$ $\frac{2x}{2} = \frac{82}{2}$

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10. One of two supplementary angles is 123° less than twice its supplement. Find the measure of both angles.

$\angle 1 = 2x - 123$

$\angle 2 = x$

$2x - 123 + x = 180$

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