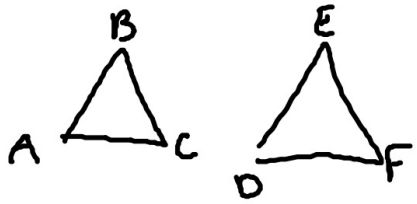
# PC-8

## Warm-up problem

**13.** Triangle $ABC$ is congruent to triangle $DEF$, $AB = 3x + 7$, $DE = 5x - 9$, and $BC = 4x$. Find:

**a.** $x$ **b.** $AB$ **c.** $BC$ **d.** $EF$




a) $x = 8$

b) $AB = 3x+7 = 3(8)+7 = 31$

c) $BC = 4x = 4(8) = 32$

d) $BC = EF = 32$

$3x+7 = 5x-9$

$-3x \quad -3x$

$7 = 2x-9$

$+9 \quad +9$

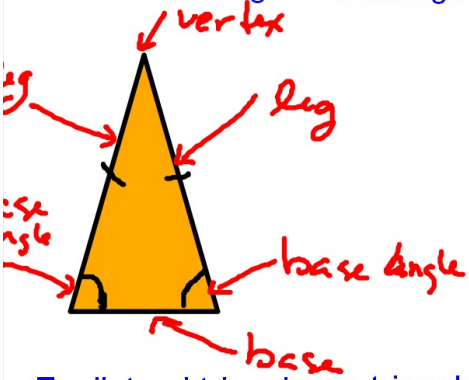
$16 = 2x$

$\frac{16}{2} = \frac{2x}{2}$

$8 = x$



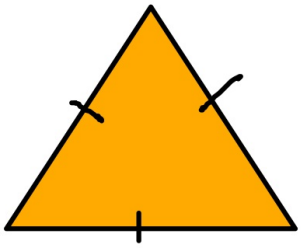
Isosceles triangle - a trianlge that has two congruent sides




- 2 ≅ legs
- 2 ≅ base ∠'s

from the vertex angle the median, altitude and angle bisector are all the same segment

Equilateral triangle - a triangle with 3 congruent sides

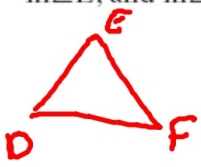


- 3 ≅ sides
- 3 ≅ angles

from any vertex

from any vertex the median, altitude and angle bisector are all the same segment

**5.** In equilateral $\triangle DEF$, $m\angle D = 3x + y$, $m\angle E = 2x + 40$, and $m\angle F = 2y$. Find $x$, $y$, $m\angle D$, $m\angle E$, and $m\angle F$.




$\frac{2x+40}{2} = \frac{2y}{2}$

$x+20 = y$

$mLD = mLE = mLF$

$mLE = 2x+40$

$= 2(10)+40$

$= 20+40$

$= 60$

$x = 10$

$y = 30$

$3x + x+20 = 2x+40$

$4x+20 = 2x+40$

$-2x \quad -2x$

$2x+20 = 40$

$-20 \quad -20$

$2x = 20$

$x = 10$