

**4.3 More Practice** (Please put your work on the same sheet as your homework. **NOT HERE.**)

1. If  $\triangle ABC \sim \triangle DEF$ , find the sum of  $x$ ,  $y$ , and  $z$ .

$$\begin{aligned} \angle A &\cong \angle D \\ \angle B &\cong \angle E \\ \angle C &\cong \angle F \end{aligned}$$

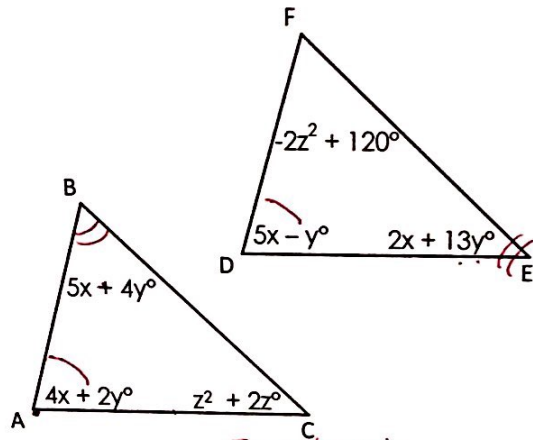
System

$$\begin{cases} 4x + 2y = 5x - y \\ 5x + 4y = 2x + 13y \end{cases}$$

$$\begin{cases} -x + 3y = 0 \\ 3x - 9y = 0 \end{cases}$$

$$-3x + 9y = 0$$

$$0 = 0 \quad ?!$$



Quadratic

$$z^2 + 2z = -2z^2 + 120$$

$$3z^2 + 2z - 120 = 0$$

$$\begin{aligned} (z + \frac{20}{3})(z - \frac{18}{3}) &= 0 \quad \begin{matrix} -360 \\ 20 \quad -18 \end{matrix} \\ (3z + 20)(z - 6) &= 0 \quad 2 \end{aligned}$$

$$z = -\frac{20}{3} \quad z = 6 \quad m\angle F = 76^\circ$$

$m\angle F = 31\frac{1}{4}^\circ$  Both work!

When  $z = 6$

$$\begin{cases} \triangle ABC \\ \triangle DEF \end{cases} \begin{cases} 7x + 12y = 132 \\ 9x + 6y = 132 \end{cases}$$

$$\begin{cases} 7x + 12y = 132 \\ -18x + 12y = -264 \end{cases}$$

$$-11x = -132$$

$$x = 12$$

$$9(12) + 6y = 132$$

$$y = 4$$

$$\text{Sum} = 12 + 4 + 6 = 22 \quad \star$$

4.3 Congruent Triangles

When  $z = -\frac{20}{3}$  or  $-6\frac{2}{3}$

$$\begin{cases} \triangle ABC \\ \triangle DEF \end{cases} \begin{cases} 7x + 12y = 148\frac{8}{9} \\ 9x + 6y = 148\frac{8}{9} \end{cases}$$

$$\begin{cases} 7x + 12y = 148\frac{8}{9} \\ -18x + 12y = -298\frac{7}{9} \end{cases}$$

$$-11x = -148\frac{8}{9}$$

$$x = \frac{1340}{99}$$

$$\begin{cases} 63x + 108y = 1340 \\ -63x + 42y = -1042\frac{7}{9} \end{cases}$$

$$166y = 297\frac{7}{9}$$

$$y = \frac{1340}{297}$$

$$\text{Sum} = -\frac{20}{3} + \frac{1340}{99} + \frac{1340}{297} = \frac{3380}{297} \quad \star$$