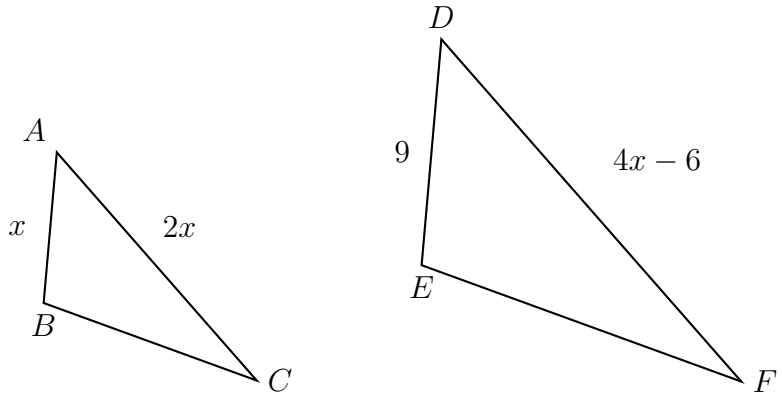
11.13 Similarity algebra

1. In the diagram below $\triangle ABC \sim \triangle DEF$, $DE = 9$, $AB = x$, $AC = 2x$, $DF = 4x - 6$.

   Determine the length of $\overline{AB}$.



2. Write an equation of the line that is parallel to the line whose equation is $2x - 3y = 4$ and passes through the point $(1, 7)$.

3. Find the volume of a cone with a base circumference of 12 inches and height of 7 in., to the *nearest cubic inch*.

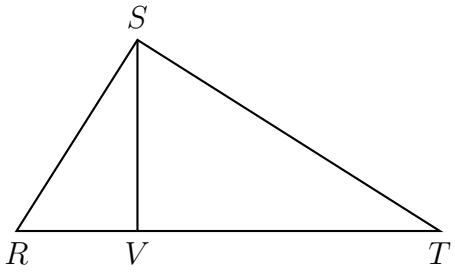
4. What are the coordinates of the center and the length of the radius of the circle whose equation is $x^2 + (y - 5)^2 = 36$?

5. In right triangle ABC, hypotenuse $\overline{AB}$ has a length of 17.5 cm, and side $\overline{BC}$ has a length of 7.1 cm. What is the measure of angle B, to the *nearest degree*?

6. The endpoints of directed line segment PR have coordinates of $P(0, -2)$ and $R(4, 10)$. What are the coordinates of point Q, on $\overline{PR}$, that divide $\overline{PR}$ into a ratio of 3:1?

7. For the acute angles in a right triangle, $\sin(70°) = \cos(2x - 10)°$.
   What is the number of degrees in the measure of the smaller angle?

8. In right triangle RST below, altitude $\overline{SV}$ is drawn to hypotenuse $\overline{RT}$.



   If $RV = 2.5$ and $TV = 8.1$, what is the length of $\overline{ST}$, to the *nearest tenth*?

9. The secants $\overline{ABC}$ and $\overline{ADE}$ intersect the circle O, as shown in the diagram.
   Given $m\widehat{BD} = 44°$ and $m\widehat{CE} = 140°$.

   (a) Find the $m\angle CDE$, $m\angle CBE$.

   (b) Find the $m\angle C$, $m\angle E$.

   (c) Find the $m\angle A$.

   (d) Two similar triangles are shown. Write a similarity statement, listing the triangles' vertices in corresponding order.