A student constructs a right-angled triangle, $\triangle ABC$, with an area of 6 cm$^2$.

She constructs a second triangle, $\triangle DEF$, whose side lengths are exactly three times the lengths of the sides of her original triangle. That is, $DE = 3AB$, $EF = 3BC$ and $DF = 3AC$.

Given this information, determine the area of $\triangle DEF$.

It may be helpful to notice that $\triangle ABC$ and $\triangle DEF$ are similar. The symbol for similarity is "~".

Two triangles are similar if their corresponding side lengths are in the same ratio. That is,

$$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF},$$

then $\triangle ABC \sim \triangle DEF$.

When two triangles are similar, it is also true that corresponding angles are equal. That is,

If $\triangle ABC \sim \triangle DEF$, then $\angle ABC = \angle DEF$, $\angle BCA = \angle EFD$, and $\angle CAB = \angle FDE$.

**Strands** Geometry and Spatial Sense, Measurement