Unit 3 Test Review

Similar Triangles:

1) In the figure, $\triangle RST \sim \triangle XYZ$.
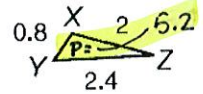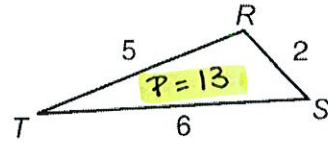   a) Find the scale factor of $\triangle RST$ to $\triangle XYZ$. —old —new $\boxed{\dfrac{2}{5}}$
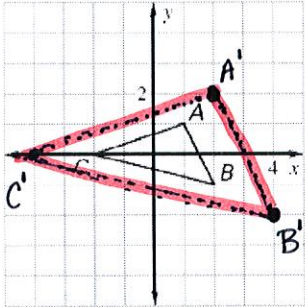
   new/old

   b) Find the perimeter of both triangles. What is the ratio of the perimeters of the 2 triangles?

   $\dfrac{5.2}{13} = \boxed{\dfrac{2}{5}}$
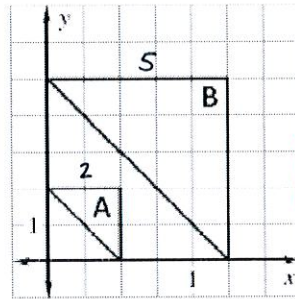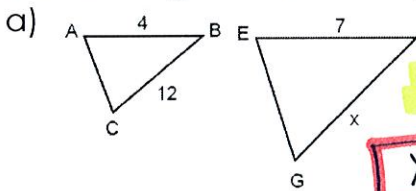
2) Dilations:
   a) Draw a dilation with k = 2

   b) Determine the scale factor, k = ____
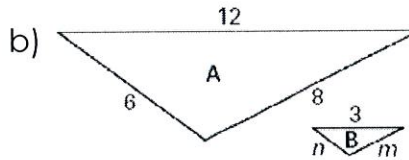
   $A \rightarrow B = \dfrac{5}{2}$

   $B \rightarrow A = \dfrac{2}{5}$
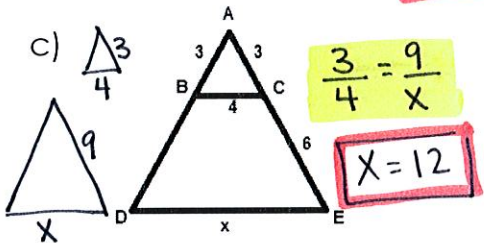
3) Find the length of the missing side(s).
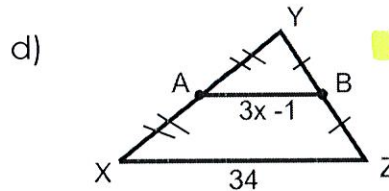   a)

   $\dfrac{4}{7} = \dfrac{12}{x}$

   $\boxed{X = 21}$

   b)

   $\dfrac{12}{3} = \dfrac{8}{m}$ $\boxed{m = 2}$

   $\dfrac{12}{3} = \dfrac{6}{n}$ $\boxed{n = 1.5}$

   c)

   $\dfrac{3}{4} = \dfrac{9}{x}$

   $\boxed{X = 12}$

   d)
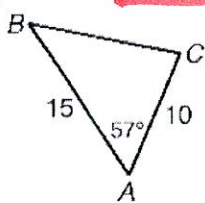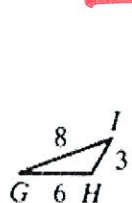
   $2(3x-1) = 34$

   $\boxed{X = 6}$

4) Determine if the following triangles are similar. If so, give the postulate and similarity statement.
   a) $\triangle ABC \sim \triangle DEF$ by $SAS \sim$

   $\angle A \cong \angle D$

   $\dfrac{10}{12} = \dfrac{15}{18}$

   $\dfrac{5}{6} = \dfrac{5}{6}$ ✓

   b) $\triangle GHI \sim \triangle LKJ$ by $SSS \sim$

   $\dfrac{3}{9} = \dfrac{6}{18} = \dfrac{8}{24}$ ✓

   $\frac{1}{3} = \frac{1}{3} = \frac{1}{3}$

   c) $\triangle MNO \sim \triangle PQO$ by $AA \sim$
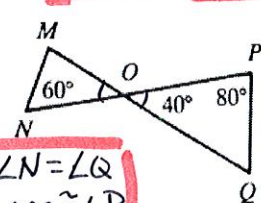
   $\angle N = \angle Q$

   $\angle M \cong \angle P$

5) If a 42.9 ft tall flagpole casts a 253.1 ft long shadow, then how long is the shadow that a 6.2 ft. tall woman casts?
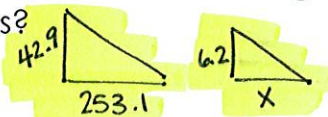
   $\dfrac{42.9}{253.1} = \dfrac{6.2}{x}$ $\boxed{X = 36.6}$

SOHCAHTOA:

6) a) Find the 3 trig ratios from Angle A and Angle B.

$$\sin A = \frac{15}{17} \quad \cos A = \frac{8}{17} \quad \tan A = \frac{15}{8} \quad \sin B = \frac{8}{17} \quad \cos B = \frac{15}{17} \quad \tan B = \frac{8}{17}$$

b) How do the ratios compare for the two angles?

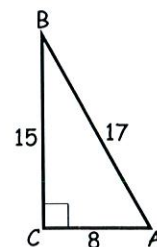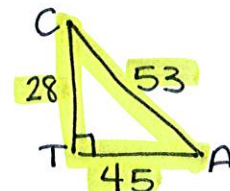$$\boxed{\sin A = \cos B} \quad \boxed{\sin B = \cos A} \quad \boxed{\tan A = \frac{1}{\tan B}}$$

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7) **Draw △CAT where ∠ATC = 90°, CA = 53, and CT = 28.**

a) What is the length of AT? $28^2 + x^2 = 53^2 \rightarrow \boxed{45}$

b) What is sin C? $\boxed{\frac{45}{53}}$ c) What is tan A? $\boxed{\frac{28}{45}}$

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8) **Draw △ABC where ∠B = 90° and $\sin A = \frac{12}{20}$.**

a) What is the length of AB? $x^2 + 12^2 = 20^2 \rightarrow \boxed{16}$

b) What is tan A? $\frac{12}{16} = \boxed{3/4}$ c) What is cos A? $\frac{16}{20} = \boxed{4/5}$

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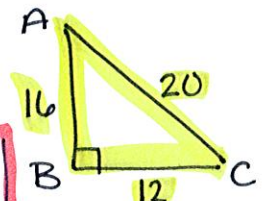
9) Solve for the missing side or angle using Trig Ratios (sin, cos, tan).

a) $\tan \theta = \frac{4}{13}$ $\boxed{\theta = 17.1}$

$\theta = \tan^{-1}\left(\frac{4}{13}\right)$

b) $\tan 32 = \frac{x}{13}$ $\boxed{x = 8.1}$

$x = 13 \cdot \tan 32$

c) $\cos 60 = \frac{x}{11}$ $\boxed{x = 5.5}$

$x = 11 \cos 60$

d) $\tan 50.1 = \frac{x}{5}$

$x = 5 \cdot \tan 50.1$

$\boxed{x = 6}$

e) $\tan \theta = \frac{7.7}{14}$

$\theta = \tan^{-1}\left(\frac{7.7}{14}\right)$

$\boxed{\theta = 28.8}$

f) $\sin 57 = \frac{10.8}{x}$ $x = \frac{10.8}{\sin 57}$

$\boxed{x = 12.9}$

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10) An 8 foot ladder is leaning against a wall so that the base is 5 feet from the base of the wall. What angle does the ladder make with the ground? Round to the nearest tenth.

$$\cos x = \frac{5}{8} \quad x = \cos^{-1}\left(\frac{5}{8}\right) \quad \boxed{x = 51.3}$$

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11) A surveyor is standing 25 ft from a building and is looking at the top with an angle of elevation of 65°. If his eye height is 6 ft, how tall is the building? Round to the nearest tenth.

$$\tan 65 = \frac{x}{25} \quad x = 25 \tan 65 \quad 53.6 + 6$$
$$x = 53.6 \quad \boxed{59.6}$$

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12) A kite is being flown using 150 yards of string. The kite has an angle of elevation with the ground of 65 degrees. How high above the ground is the kite?

$$\sin 65 = \frac{x}{150} \quad x = 150 \sin 65 \quad \boxed{x = 135.9}$$