Find the values of x and y. Leave your answers in simplest radical form.

**1.**

16

60°

8

$8\sqrt{3}$

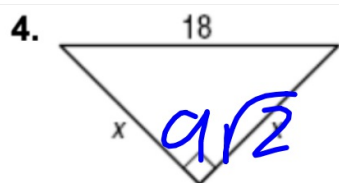**2.**

60°

$\frac{1}{2}$

x  1

30°

y

$\frac{1}{2}\sqrt{3}$

**3.**

28

14

30°

$14\sqrt{3}$

**4.**

18

x  $9\sqrt{2}$

$\frac{18}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$= \frac{18\sqrt{2}}{2}$

**5.**

8

45°

x  $4\sqrt{2}$

$\frac{8}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$= \frac{8\sqrt{2}}{2}$

**6.**

10

x
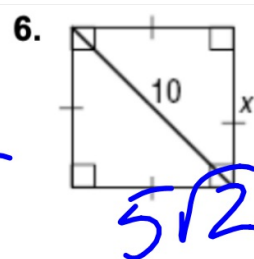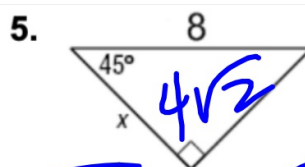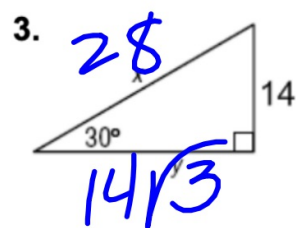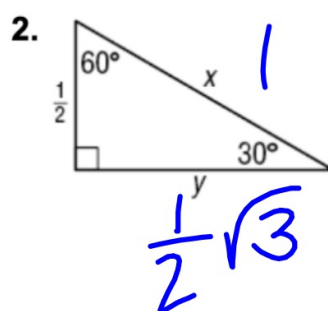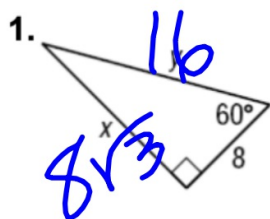
$5\sqrt{2}$

$\frac{10\sqrt{2}}{2}$

Determine whether each set of numbers will form an acute, obtuse, or right triangle.

7. $5\sqrt{2}$, 12, 11

$11$
$121$

$(5\sqrt{2})^2 + 10^2$
$25 \cdot 2$

$< \quad 50 + 100$

acute

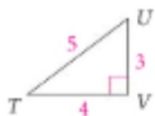8. 30, 40, 50

right

9. 10, 11, 20

obtuse

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Geometry                         8-3: The Tangent Ratio

**Objective: I can use tangent ratios in right triangles to find missing sides.**

Example 1: (a) Write the tangent ratios for $\angle T$ and $\angle U$.

$\angle T = \dfrac{3}{4}$

$\angle U = \dfrac{4}{3}$

QC 1: (a) Write the tangent ratios for $\angle K$ and $\angle J$.

$\angle K = \dfrac{3}{7}$

$\angle J = \dfrac{7}{3}$
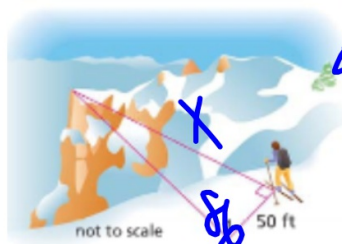
(b) How is $\tan T$ related to $\tan U$?

recipricols

(b) How is $\tan K$ related to $\tan J$?

recipricols

We can use the tangent ratio to measure distances that would be difficult to measure directly or to find missing legs in right triangles.

$\tan(86)\cdot 50)$

Example 2: Your goal in Bryce Cannon National Park is the distant cliff. About how far away is the cliff if $m\angle 1 = 86°$?
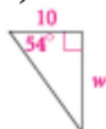

not to scale   86   50 ft

$50\cdot \tan 86 = \dfrac{x}{50}\cdot 50$

$x = 715\ ft$

QC 2: Find the value of $w$ to the nearest tenth.

A)


10   54°   w

$\tan 54 = \dfrac{w}{10}$

$w = 13.8$

B)


w   28°   1.0

$w = 1.9$

$\tan 28 = \dfrac{1}{w}$

$\dfrac{w\cdot \tan 28}{\tan 28} = \dfrac{1}{\tan 28}$

C)


2.5   57°   33°   w

$\tan 57 = \dfrac{w}{2.5}$

$w = 3.8$

**Objective 2: I can use tangent ratios in right triangles to find missing angles.**
If you know the leg lengths of a right triangle, you can find the _tan_ ratio for each acute angle. If you know the tangent ratio for any angle, you can use the _Inverse tan_ to find that missing angle.

Step 1: Set up the tangent ratio for an acute angle in the right triangle.

Step 2: Use the inverse tangent key on the calculator to find the angle.

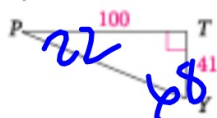Step 3: Find the other acute angle by _subt. from 180_

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**Example 3:** Find $m\angle X$ to the nearest degree. Then find $m\angle H$.

53
10
6
37
B   8   X

$$\tan X = \frac{6}{8}$$
$$X° = \tan^{-1}\left(\frac{6}{8}\right)$$
$$= 37°$$

## QC 3:

A) Find $m\angle Y$ to the nearest degree. Then find $m\angle P$.

P — 22 — 100 — T — 41 — 68 — Y

$$Y = \tan^{-1}(100/41)$$
$$68°$$

B) Find $m\angle R$ to the nearest degree. Then find $m\angle T$.

R — 49 — 41 — S — 47 — 41 — T
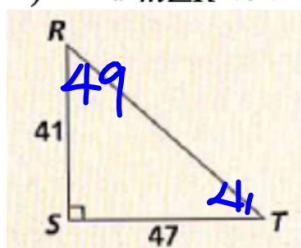
$$\angle R = \tan^{-1}(47/41) = 49°$$
$$\angle T = \tan^{-1}(41/47)$$

Classwork: Practice 8-3 Worksheet

Hwk #15 -

Sec 8-3

Pages 434-435

Problems 1, 2, 5, 8-12, 16

IXL #9 - Q.1 & Q.4 due Friday at 4pm!