Chapter 2 Review

For each type of question, the achievement level is indicated. Showing work is an important strategy in communicating your knowledge and ideas so please be thorough.

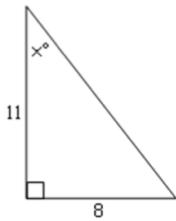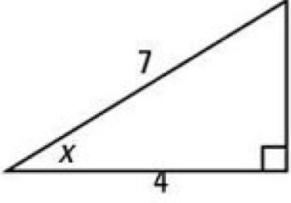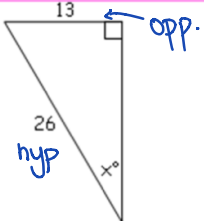| **Learning Goal 2.1**	Apply the trigonometric ratios to calculate unknown lengths and angles in a right triangle.

1. Find the value of each ratio to the nearest hundredth. — 2 decimal places

a. $\tan 60°$	b. $\cos 10°$	c. $\tan 75°$	d. $\cos 75°$	e. $\sin 75°$	f. $\cos 24°$
g. $\tan 10°$	h. $\sin 85°$	i. $\cos 85°$	j. $\tan 85°$	k. $\sin 10°$	l. $\sin 24°$

b. $\cos 10 = 0.98$ e. $\sin 75 = 0.97$ j. $\tan 85 = 11.43$

2. Find the value of each angle to the nearest angle.

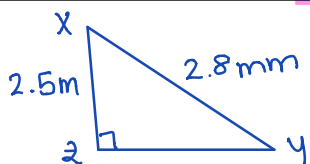| a. $\tan \theta = 1.25$	b. $\tan \theta = 0.1$	c. $\tan \theta = 0.56$
d. $\sin \theta = 0.25$	e. $\sin \theta = 0.1$	f. $\sin \theta = 0.37$
g. $\cos \theta = 0.25$	h. $\cos \theta = 0.1$	i. $\cos \theta = 0.37$
j.	k.	l.

j. triangle with $x°$, sides 11 and 8

k. triangle with hypotenuse 7, x angle, side 4

l. triangle with 13 (opp.), 26 (hyp), $x°$

c. $\tan^{-1}(\tan \theta) = (0.56)^{\tan^{-1}}$

$\theta = 29°$

d. $\sin^{-1}(\sin \theta) = (0.25)^{\sin^{-1}}$

$\theta = 14°$

h. $\cos^{-1}(\cos \theta) = (0.1)^{\cos^{-1}}$

$\theta = 84°$

l. $\sin x = \dfrac{13}{26}$

$x = 30°$

3. Find the value of each ratio.

a.	b.	c.
$\tan X$ $\qquad XZ = 4$cm $\sin Y$ if $YZ = 9$ cm $\cos X$ $\qquad XY = 9.8$ cm	$\tan Y$ $\qquad XZ = 2.5$ mm $\sin Y$ if $YZ = 1.3$ mm $\cos X$ $\qquad XY = 2.8$ mm	$\tan Y$ $\qquad XZ = 90$ m $\sin X$ if $YZ = 100$ m $\cos Y$ $\qquad XY = 134.5$ m

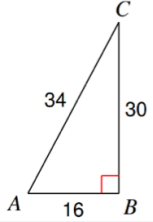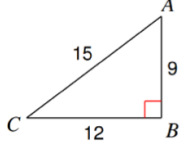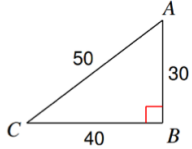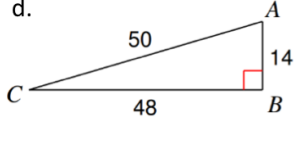triangle: X, 2.5m, 2.8mm, 2, y

↑ hyp

* NTS *

$\tan y = \dfrac{2.5 \times 10}{1.3 \times 10}$

$\tan y = \dfrac{25}{13}$

$\sin y = \dfrac{2.5 \times 10}{2.8 \times 10}$

$\sin y = \dfrac{25}{28}$

1.3 mm

$$\cos X = \frac{2.5 \times 10}{2.8 \times 10}$$

$$\cos X = \frac{25}{28}$$

4. Find the value of all 6 trig ratios for each triangle.

a.	b.	c.	d.

a. triangle: C, 34, 30, A, 16, B

b. triangle: A, 15, 9, C, 12, B

c. triangle: A, 50, 30, C, 40, B

d. triangle: A, 50, 14, C, 48, B

TOA

$$\tan A = \frac{48 \div 2}{14 \div 2} = \frac{24}{7}$$

$$\tan C = \frac{14}{48} = \frac{7}{24}$$

SOH

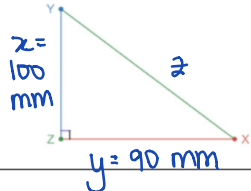$$\sin A = \frac{48 \div 2}{50 \div 2} = \frac{24}{25}$$

$$\sin C = \frac{14}{50} = \frac{7}{25}$$

CAH

$$\cos A = \frac{14 \div 2}{50 \div 2} = \frac{7}{25}$$

$$\cos C = \frac{48}{50} = \frac{24}{25}$$

5. Find the value sine and cosine for both angles X and Y.

a. $XZ = 4$ cm $YZ = 9$ cm	b. $XZ = 2.5$ mm $YZ = 1.3$ mm	c. $XZ = 90$ mm d. $YZ = 100$ mm	

$x = 100$ mm z $y = 90$ mm

$$x^2 + y^2 = z^2$$
$$100^2 + 90^2 = z^2$$
$$10000 + 8100 = z^2$$
$$\sqrt{18100} = \sqrt{z^2}$$
$$z = 134.5$$
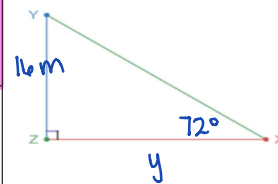
$$\sin X = \frac{100 \times 10}{134.5 \times 10} = \frac{1000}{1345}$$

$$\cos X = \frac{90 \times 10}{134.5 \times 10} = \frac{900}{1345}$$

$$\sin Y = \frac{900}{1345}$$

$$\cos Y = \sin X = \frac{1000}{1345}$$

6. Find the indicated length.				
a. ∡X = 25° XZ = 15 cm YZ = ?	b. ∡X = 50° XZ = 15 ft YZ = ?	c. ∡X = 42° XZ = 10 m YZ = ?	d. ∡X = 72° YZ = 16m XZ = ?	16 m 72° y
e. ∡X = 18° YZ = 20 cm XZ = ?	f. ∡X = 52° YZ = 50 ft XZ = ?	g. ∡X = 25° XZ = 15 cm XY = ?	h. ∡X = 50° XY = 15 ft YZ = ?	
i. ∡X = 18° XY = 20 cm XZ = ?	j. ∡X = 52° YZ = 50 ft XY = ?	k. ∡X = 42° XZ = 10 m XY = ?	l. ∡X = 72° XY = 16 m XZ = ?	

$$\tan X = \frac{x}{y}$$

$$y \times \tan 72 = \frac{16}{y} \times y$$

$$\frac{y \times \tan 72}{\tan 72} = \frac{16}{\tan 72}$$

$$y = 5.2 \, m$$

7. Solve for x.			
a. 24, x, 53°	b. 12, x, 28°	c. x, 31°, 17	d. 10, x°, 7

$$\sin \theta = \frac{opp}{hyp}$$

$$x \times \sin 28 = \frac{12}{x} \times x$$

$$\frac{x \times \sin 28}{\sin 28} = \frac{12}{\sin 28}$$

$$x = 25.56$$

8. Solve the given triangles. — find all angles and side lengths

a.	b.	c.	d.	e.
Triangle with side 6, angles 73° and 90°, side x	Triangle with 24°, side 12, side x	Triangle with x, 68°, 21, right angle	Triangle with x, 29, 19°	Triangle with 29, 33°, x

f.	g.	h.
Triangle with 37°, side 12, side x	Triangle with x, θ, y, 21°, 22	Triangle with 35, 70°

1. $\theta = 180 - 90 - 21$
   $= 69°$

2. $\overset{22}{\times} \sin 21 = \dfrac{x}{22} \times 22$

   $x = 22 \times \sin 21$

   $x = 7.88$

3. $\overset{22}{\times} \cos 21 = \dfrac{y}{22} \times 22$

   $y = 22 \times \cos 21$

   $y = 20.54$

9. Solve the given triangles.   EXTENDING

a.	b.	c.	d.	e.
Triangle 48, c, 14	Triangle x, 15°, 16	Triangle x, 16	Triangle 45°, 35, x	Triangle 29, θ, 55°, x, y, 12

f.	g.
Triangle x, 51°, 14	Triangle Y, 5, x, z, Z
Triangle x, 63° (part c)	

1. $\theta = 180 - 90 - 55$
   $= 35°$

2. $\overset{x}{\times} \tan 55 = \dfrac{29}{x} \times x$
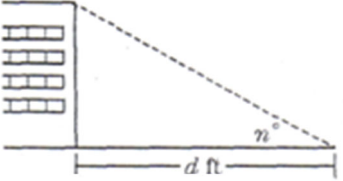
   $\dfrac{x \tan 55}{\tan 55} = \dfrac{29}{\tan 55}$
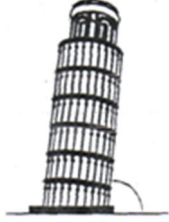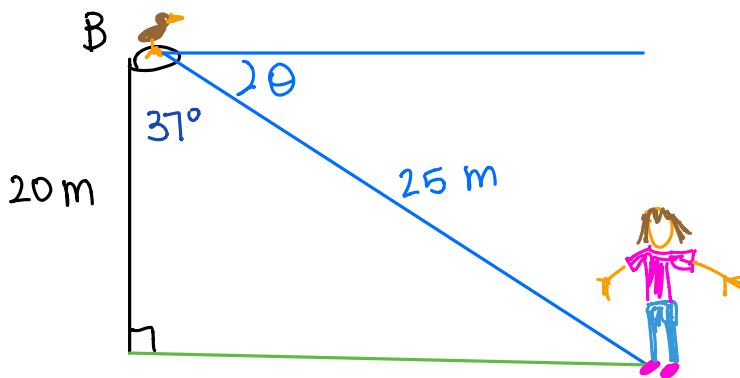
   $x = 20.31$

3. $\overset{y}{\times} \sin 55 = \dfrac{29}{y} \times y$

   $\dfrac{y \sin 55}{\sin 55} = \dfrac{29}{\sin 55}$

   $y = 35.40$

Chapter 2 Review

	h.	i.	j.
	183 33 b	47° 28 X	14 49° X

1. To the nearest tenth of a foot, how tall is a building 100 feet away if the top of the building is sighted at a 20° angle?

n

d ft

2. If an object is dropped from the top of the leaning tower of Pisa, it will land about 13 feet from the base of the tower. If the length (i.e., height) of the tower is 183 ft, what is the angle that the tower makes with the ground?

3. Suppose a tree casts a shadow of length 60 feet. If the distance from the top of the tree to the end of the shadow is 80 feet, what is the angle of elevation from the shadow to the top of the tree?

4. A bird sits on top of a lamppost 20 meters tall. The distance from the bird to the feet of an observer is 25 meters. Find the angle of depression from the bird to the feet of the observer.

B

θ

37°

20 m

25 m

$\cos^{-1}(\cos B) = \frac{20}{25} = \left(\frac{4}{5}\right)^{\cos^{-1}}$

$B = \cos^{-1}\left(\frac{4}{5}\right)$

$B = 37°$

$\theta = 90 - 37°$

$= 53°$

The angle of depression from the bird to the observer is 53°.

Name: _____   Date: _____

Chapter 2 Review