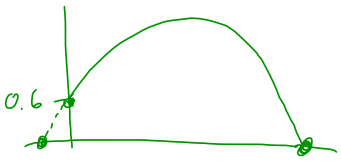
p. 254 **6.** A T-ball player hits a ball from a tee that is 0.6 m tall. The height of the ball at a given time is modelled by the function $h(t) = -4.9t^2 + 7t + 0.6$, where height, $h(t)$, is in metres and time, t, is in seconds.

a) What will the height be after 1 s?

b) When will the ball hit the ground?



a) $t = 1$ s

$h(1) = -4.9(1)^2 + 7(1) + 0.6$

$= -4.9 + 7 + 0.6$

$= 2.7$ m

b) ball hits the ground

$h(t) = 0$

$0 = -4.9t^2 + 7t + 0.6$

$t = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$= \dfrac{-(7) \pm \sqrt{7^2 - 4(-4.9)(0.6)}}{2(-4.9)}$

$= \dfrac{-7 \pm \sqrt{49 + 11.76}}{-9.8}$

$t = \dfrac{-7 + \sqrt{60.76}}{-9.8}$ $\quad$ $t = \dfrac{-7 - \sqrt{60.76}}{-9.8}$

$\doteq -0.081$ $\quad$ $\doteq 1.5096$

$= 1.510$

p. 254

8. For the function $f(x) = kx^2 + 8x + 5$, what value(s) of k will have

a) two distinct real solutions?

b) one real solution?

c) no real solution?

$a = k \quad b = 8 \quad c = 5$

a) $b^2 - 4ac > 0$

$(8)^2 - 4(k)(5) > 0$

$64 - 20k > 0$

$-20k > -64$

$k < \frac{-64}{-20}$

$k < \frac{16}{5}$

b) $b^2 - 4ac = 0$

$(8)^2 - 4(k)(5) = 0$

$64 - 20k = 0$

$-20k = -64$

$k = \frac{-64}{-20}$

$k = \frac{16}{5}$

c) $b^2 - 4ac < 0$ No Solutions Real

$(8)^2 - 4(k)(5) < 0$

$64 - 20k < 0$

$-20k < -64$

$k > \frac{-64}{-20}$

$k > \frac{16}{5}$

Today's Learning Goal(s):

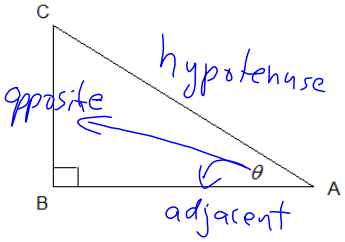
By the end of the class, I will be able to:

a) Define the following terms: acute angle, right angle, hypotenuse
b) Use the Pythagorean Theorem (PT) to find the length of a side.
c) Identify the opposite, adjacent and hypotenuse side of a triangle relative to a given angle.

MCF 3MI Unit 5: Getting Started

Date: Apr. 10/19

SOH CAH TOA

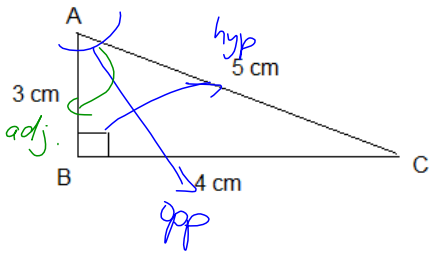


$\sin\theta = \frac{opp.}{hyp.}$

$\cos\theta = \frac{adj}{hyp}$

$\tan\theta = \frac{opp}{adj}$

Ex. 1 State the primary trig ratios for $\angle A$

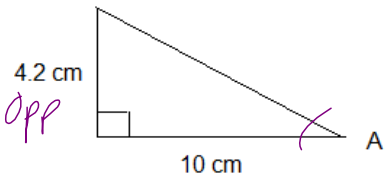


SOH CAH TOA

$\sin A = \frac{4}{5} = 0.8$ $\cos A = \frac{3}{5}$ $\tan A = \frac{4}{3}$

Ex. 2 Calculate the measure of the indicated angle.

a)



adj

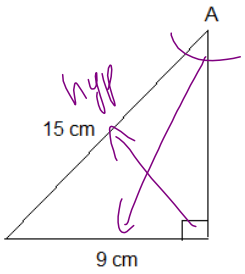
(TOA) $\tan A = \frac{4.2}{10}$

$A = \tan^{-1}\left(\frac{4.2}{10}\right)$

$\doteq 22.78$

$\doteq 22.8^\circ$

b) Method: Label, Ratio, Solve.



SOH

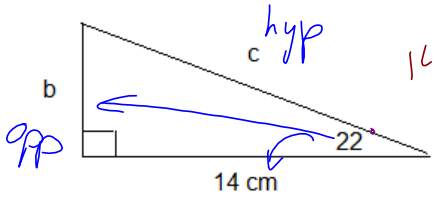
$\sin A = \frac{9}{15}$

$A = \sin^{-1}\left(\frac{9}{15}\right)$

$\doteq 36.86$

$\doteq 36.9^\circ$

Ex. 3 Find the missing sides in the following diagram.



hyp
opp
adj

TOA

$\tan 22^\circ = \frac{b}{14}$

$14 \times \tan 22^\circ = b$

$b \doteq 5.656$

$\doteq 5.66$ cm

CAH

$\cos 22^\circ = \frac{14}{c}$

$c \cdot \cos 22^\circ = 14$

$c = \frac{14}{\cos 22^\circ}$

$\doteq 15.099$

$\doteq 15.10$ cm

Ex. 4 Use a calculator to evaluate to the nearest thousandth (3 decimal places).

a) $\sin 72^\circ$ $\doteq 0.9510$ $\doteq 0.951$

b) $\tan 11^\circ$ $\doteq 0.1943$ $\doteq 0.194$

c) $\cos 49^\circ$ $\doteq 0.6560$ $\doteq 0.656$

Ex. 5 Use a calculator to determine θ to the nearest degree.

a) $\sin\theta = 0.8377$

$\theta = \sin^{-1}(0.8377)$

$\doteq 56.8$

$\doteq 57^\circ$

b) $\tan\theta = 0.2347$

$\theta = \tan^{-1}(0.2347)$

$\doteq 13.2$

$\doteq 13^\circ$

Homework: pp. 261-262 # 2 - 9