

Key

# Quiz 4

Show all your work. Reasonable supporting work must be shown for any partial credit.

1. [3] Given that  $\cos(\theta) = \frac{3}{4}$  and  $\frac{\pi}{2} \leq \theta \leq \pi$ , find  $\sin(\theta)$ .

note  $\cos^2(\theta) + \sin^2(\theta) = 1$  (+.5)

$(\frac{3}{4})^2 + \sin^2\theta = 1$  (+.5)

$\frac{9}{16} + \sin^2\theta = 1$

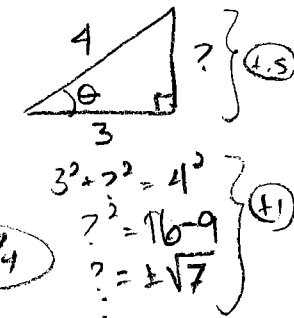
$\sin^2\theta = 1 - \frac{9}{16} = \frac{7}{16}$  (+.5)

$\sin\theta = \pm\sqrt{\frac{7}{16}}$   
 sign (+.5)  $\Rightarrow \sin\theta = -\sqrt{\frac{7}{16}}$  (+.5)

OR Sohcahtoa (+.5)  
 $\cos\theta = \frac{adj}{hyp} = \frac{3}{4}$

$\sin\theta = \pm\frac{\sqrt{7}}{4}$

sign (+.5)  $\Rightarrow \sin\theta = -\frac{\sqrt{7}}{4}$  (+.5)



Wkst 6.1 #48  
 S4.3 #32  
 Wkst Sects 1.2, 1.3  
 Try Prove Activity #1

2. The number of deer  $d$  in a region is modeled by the graph below where  $x$  is measured in years and  $x = 0$  represents 2010.

(a) [1] Approximate the population in 2020

so when  $x=10$  (+.5)

$\approx 1500$  deer (+.5)

(b) [1] What is the approximate range of  $d$ ?

$y$  values  $[1100, 1900]$  (+.5)

(c) [1] Approximate what year the deer population is at its lowest.

$\approx x = 7.5$  on the graph (+.5)

so 2017 (+.5)

(d) [2] Describe either:

- the graph transformations needed to transform the basic sine graph into the graph of  $d(x)$ , or

- the amplitude, period, and phase shift of the graph of  $d(x)$

vertical stretch by 400 (+.5)  
 vertical shift up by 1500 (+.5)  
 no horizontal shift  
 horizontal stretch by  $\frac{\pi}{5}$  (+.5)

OR Amplitude 400 (+.5)  
 Period = 10 years (+.5)  
 phase shift = none if using sine function (+.5)

(e) [2] Find an algebraic rule for the function  $d$ . (Note there are many correct answers for this!!)

OR  $d(x) = 400 \sin(\frac{\pi}{5}x) + 1500$  (+.5)  
 use sin (+.5)  
 note  $\frac{2\pi}{b} = 10 \Rightarrow 2\pi = 10b$  (+.5)  
 $\Rightarrow b = \frac{\pi}{5}$  (+.5)

$\Rightarrow d(x) = 400 \sin(\frac{\pi}{5}x) + 1500$

Wkst Sects 3.1 #11  
 Wkst Sects 4.4 #6, 5  
 Wkst Sects 4.4 #6, 5  
 Try Prove Activity #2

Wkst Sects 4.4 #7, 8  
 S4.4 #16, 50