

Name Dylan Zwick (Solutions) Date 5/27/09

Instructions: Please show all of your work as partial credit will be given where appropriate, **and** there may be no credit given for problems where there is no work shown. All answers should be completely simplified, unless otherwise stated.

(Note: This quiz is on both sides of the paper.)

1. For $y = \frac{1}{3} \cos(2(x - \pi)) - 5$, give the following information (1 pt each)

amplitude? $\frac{1}{3}$ (1 pt)

period? π (1 pt)

vertical shift 5 units (1 pt)

up or down (circle one) (1 pt)

horizontal shift π units (1 pt)

right or left (circle one) (1 pt)

2. Evaluate these limits. (3 pts)

(a) $\lim_{t \rightarrow 0} \frac{\cos^2 t}{3 - 3 \sin t}$

$$\lim_{t \rightarrow 0} \frac{\cos^2 t}{3 - 3 \sin t} = \frac{1^2}{3 - 3(0)} = \frac{1}{3}$$

Answer 2(a): $\frac{1}{3}$

(b) $\lim_{\theta \rightarrow 0} \frac{\sin(2\theta)}{\tan(5\theta)}$ (6 pts)

$$\begin{aligned} \lim_{\theta \rightarrow 0} \frac{\sin(2\theta)}{\tan(5\theta)} &= \lim_{\theta \rightarrow 0} \frac{\sin(2\theta)}{\frac{\sin(5\theta)}{\cos(5\theta)}} = \lim_{\theta \rightarrow 0} \frac{\sin(2\theta)}{\sin(5\theta)} \cdot \cos(5\theta) \\ &= \lim_{\theta \rightarrow 0} \frac{\frac{\sin(2\theta)}{2\theta} \cdot 2\theta}{\frac{\sin(5\theta)}{5\theta} \cdot 5\theta} \cdot \cos(5\theta) = \lim_{\theta \rightarrow 0} \frac{\frac{\sin(2\theta)}{2\theta}}{\frac{5}{2} \cdot \left(\frac{\sin(5\theta)}{5\theta}\right)} \cdot \cos(5\theta) \\ &= \frac{1}{\left(\frac{5}{2}\right)} \cdot 1 = \boxed{\frac{2}{5}} \end{aligned}$$

Answer 2(b): $\frac{2}{5}$