Bellwork Alg 2B Monday, June 11, 2018

1. The diameters of basketballs being produced are normally distributed with the following statistics: $\bar{x} = 9.55$ and $\sigma = 0.05$.

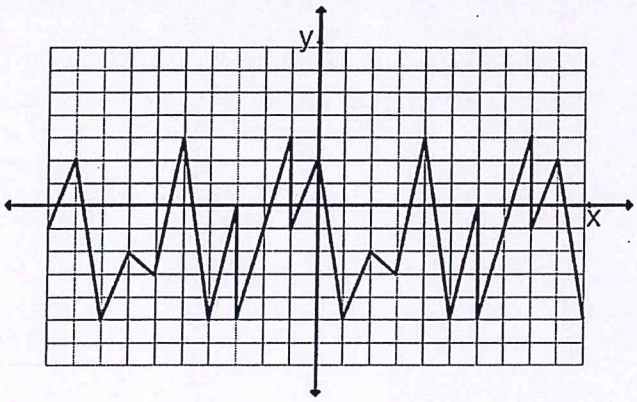
a) What percent of the basketballs have a diameter less than 9.5 inches?

b) What percent of the basketballs have a diameter between 9.6 in and 9.7 in?

c) If you randomly take a basketball, what is the probability that the diameter is greater than 9.45 in?

d) What range of diameters contain 95% of the basketballs?

2. Find the Amplitude, equation of the midline, and period of the periodic function shown below.



Amplitude =

Period =

Eq of Midline:

3. Find all solutions, $0° \leq x \leq 360°$. Give EXACT answers if possible, otherwise round to the nearest hundredth.

$3\text{Tan}^2 6x + 15\text{Tan}6x = 0$

4. Find all solutions, $0 \leq x \leq 2\pi$. Give EXACT answers if possible, otherwise round to the nearest hundredth.

$5\text{Cos}^2 x + 3\text{Cos}x = 0$

5. Find the COMPLETE solution to this equation. Give EXACT answers if possible, otherwise, round to the nearest hundredth. Give answers in radians.

$8\text{Sin}^2 7x - 5\text{Sin}7x = 0$

6. Find 5 x-intercepts and 5 VA for this function: $\text{Tan}(6.5x)$

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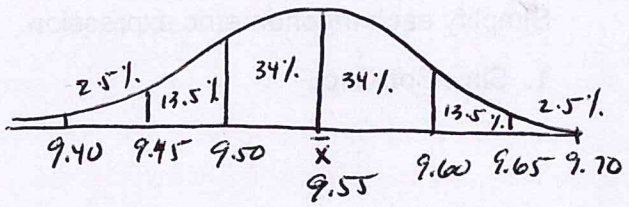
Answers

(1) a) 16% b) 16%

c) 97.5% d) 9.45 in to 9.65 in



(2) Amplitude = 4 Period = 9 midline: $y = -1$

(3) $3\tan^2 6x + 15\tan 6x = 0$

$3\tan 6x(\tan 6x + 5) = 0$

~~$3\tan 6x(5\tan 6x + 5) = 0$~~

period $= \frac{180}{6} = 30$

$3\tan 6x = 0$

$\tan 6x = 0$

$\frac{6x}{6} = \frac{0, 180, 360}{6}$

$x = 0, 30, 60$

ADD periods

$\tan 6x + 5 = 0$

$\tan 6x = -5$

$6x = \tan^{-1}(-5)$

$\frac{6x}{6} = \frac{-78.6° \pm 101.31°}{6}$

$+360$

$\frac{281.31°}{6}$

$x = 46.89° \pm 16.89°$

ADD periods

$x =$		
0	46.89	16.89
30	76.89	~~46.89~~
60		
90	106.89	
120		
150	136.89	
180	166.89	
210	196.89	
240	226.89	
270	256.89	
300	286.89	
330	316.89	
360	346.89	

repeats

(4) $5\cos^2 x + 3\cos x = 0$

$\cos x(5\cos x + 3) = 0$

Period $= 2\pi$

$\cos x = 0$

$x = \pi/2, 3\pi/2$

$5\cos x + 3 = 0$

$\cos x = -3/5$

$x = \cos^{-1}(-3/5)$

$x = 2.21$ & -2.21

$-2.21 + 2\pi = 4.07$

$x = \pi/2, 3\pi/2, 2.21, 4.07$

(5) $8\sin^2 7x - 5\sin 7x = 0$

$\sin 7x(8\sin x - 5) = 0$

Period $= \frac{2\pi}{7}$

$\sin 7x = 0$

$7x = 0, \pi, 2\pi$

$\frac{7x}{7} = \frac{0}{7}, \frac{\pi}{7}, \frac{2\pi}{7}$

$x = 0, \pi/7, 2\pi/7$

$8\sin x - 5 = 0$

$\sin x = 5/8$

$7x = \sin^{-1}(5/8)$

$\frac{7x}{7} = \frac{0.68}{7}$ & $\frac{\pi - .68}{7}$

$\pi - .68 = 2.46$

$\frac{2.46}{7} = 0.35$

$x = \underbrace{0, \pi/7, 2\pi/7, 0.10, 0.35}_{+ \frac{2\pi}{7} n}$

⑥ $y = \tan 6.5x = \tan \frac{13x}{2}$

$\text{period} = \frac{\pi}{13/2} = \frac{2\pi}{13}$

X-INT: $x = 0, \pm \frac{2\pi}{13}, \pm \frac{4\pi}{13}$

VA: $x = \pm \frac{\pi}{13}, \pm \frac{3\pi}{13}, \pm \frac{5\pi}{13}$