

Bellwork Alg 2B Thursday, May 24, 2018

- Find all values of θ for $0 < \theta < 360^\circ$ that makes this equation true. Round to the nearest hundredth.
 $-7\tan 4\theta + 10 = 1$

- Find all values of θ for $0 < \theta < 2\pi$ that makes this equation true. Round to the nearest hundredth.
 $-10\cos 3\theta + 5 = 3$

- Find all EXACT values of θ for $0 < \theta < 2\pi$ that makes this equation true.
 $8\sin 5\theta - 3 = 1$

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(1)

$$-7 \tan 4\theta + 10 = 1$$

$-10 \quad -10$

$$\frac{-7 \tan 4\theta}{-7} = \frac{-9}{-7}$$

$$\tan 4\theta = 9/7 \quad 4\theta = \tan^{-1}(9/7)$$

$$4\theta = \frac{52.13^\circ}{4} \quad \& \quad \frac{232.13^\circ}{4}$$

$$\theta = \boxed{\begin{array}{l} 13.03^\circ \quad \& \quad 58.03^\circ \\ 103.03^\circ \\ 148.03^\circ \\ 193.03^\circ \\ 238.03^\circ \\ 283.03^\circ \\ 328.03^\circ \end{array}}$$

$$\text{period} = \frac{180^\circ}{4} = 45^\circ$$

(2)

$$-10 \cos 3\theta + 5 = 3$$

$-5 \quad -5$

$$\frac{-10 \cos 3\theta}{-10} = \frac{-2}{-10}$$

$$\cos 3\theta = .2$$

$$3\theta = \cos^{-1}(.2)$$

$$\frac{3\theta}{3} = \frac{1.37}{3} \quad \& \quad \frac{-1.37}{3} + \frac{2\pi}{3}$$

$\frac{4.91}{3}$

$$\text{period} = 2\pi/3$$

$$\theta = \boxed{\begin{array}{l} 0.46 \quad \& \quad 1.64 \\ 2.55 \quad \quad 3.73 \\ 4.65 \quad \quad 5.83 \end{array}}$$

(3)

$$8 \sin 5\theta - 3 = 1$$

$+3 \quad +3$

$$\frac{8 \sin 5\theta}{8} = \frac{4}{8}$$

$$\sin 5\theta = 1/2$$

$$\frac{5\theta}{5} = \frac{\pi/6}{5} \quad \& \quad \frac{5\pi/6}{5}$$

$$\theta = \frac{\pi}{30} \quad \& \quad \frac{5\pi}{30}$$

$$\frac{13\pi}{30}$$

$$\frac{17\pi}{30}$$

$$\frac{25\pi}{30}$$

$$\frac{29\pi}{30}$$

$$\frac{37\pi}{30}$$

$$\frac{41\pi}{30}$$

$$\frac{49\pi}{30}$$

$$\frac{53\pi}{30}$$

$$\text{period} = \frac{2\pi}{5} \cdot \frac{6}{6}$$

$$= \frac{12\pi}{30}$$