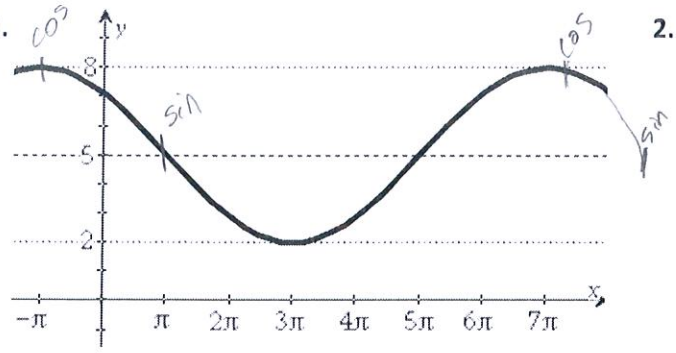
Trig Graphing – WS 4 Name Key

Write an equation for each sinusoid graphed below. You may write sine or cosine functions.

1.



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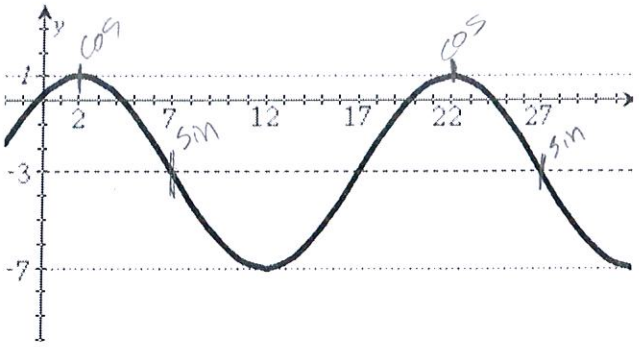

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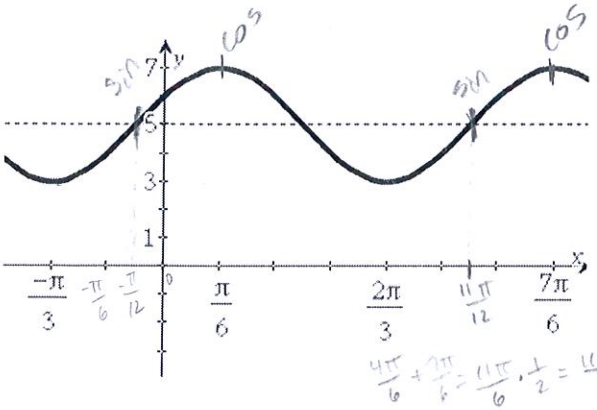
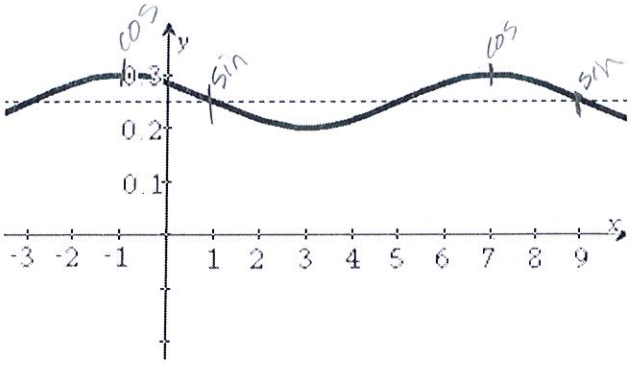


$\frac{4\pi}{6} + \frac{3\pi}{6} = \frac{11\pi}{6}, \frac{1}{2} = \frac{11\pi}{12}$

4.



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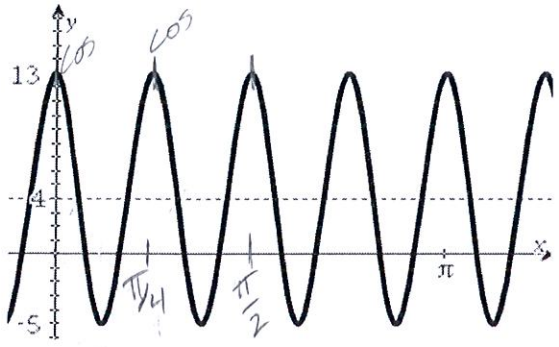

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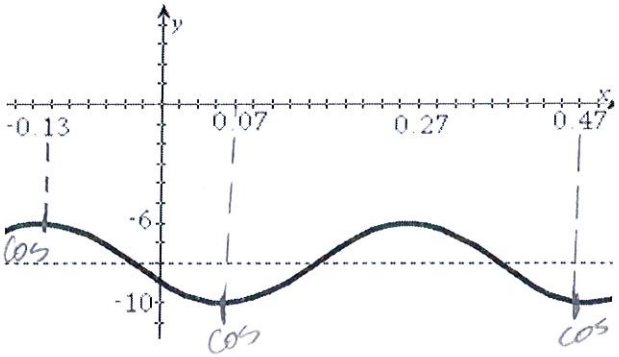

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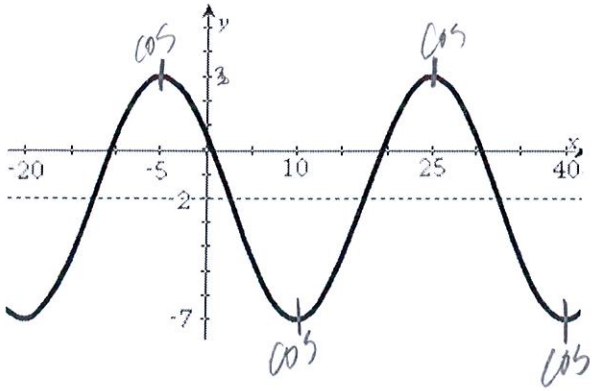

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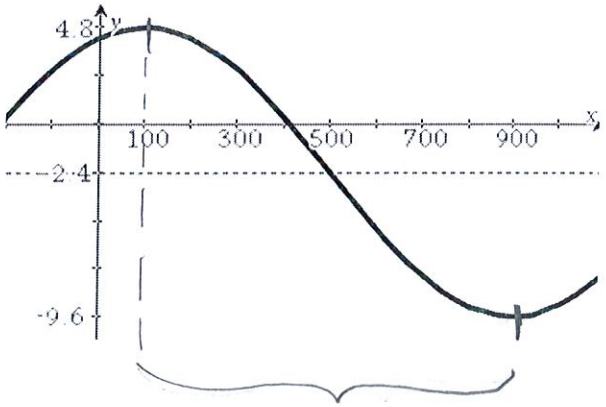
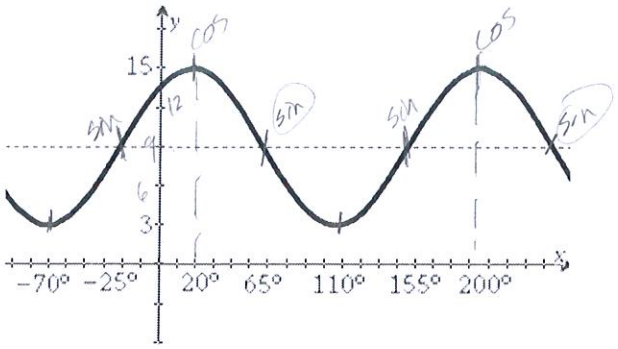


$\frac{1}{2}$ period = 800

1 period = 1600

9.



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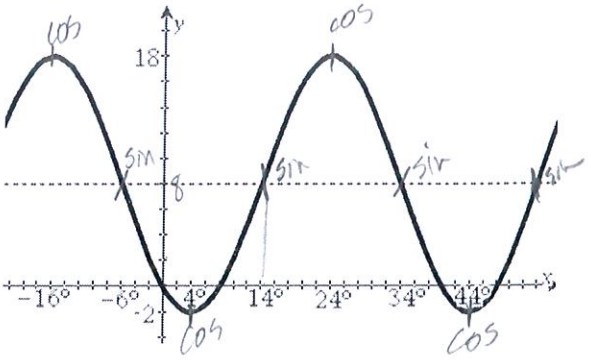

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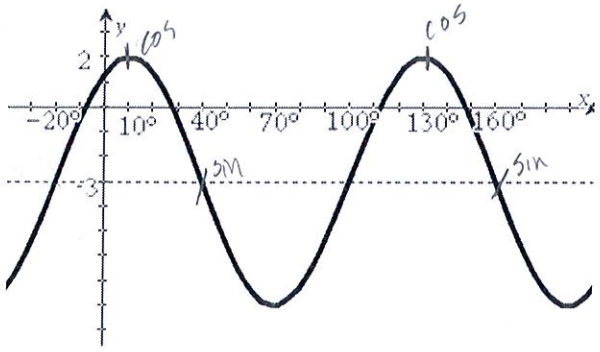

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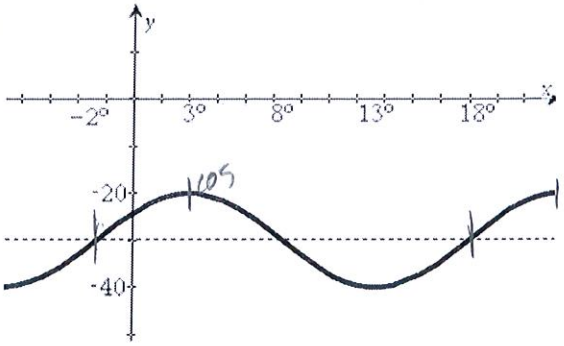
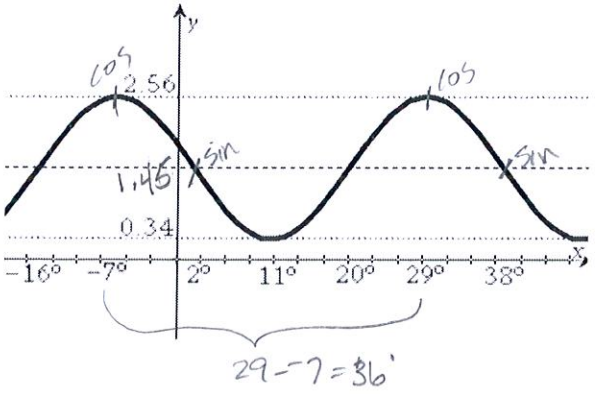
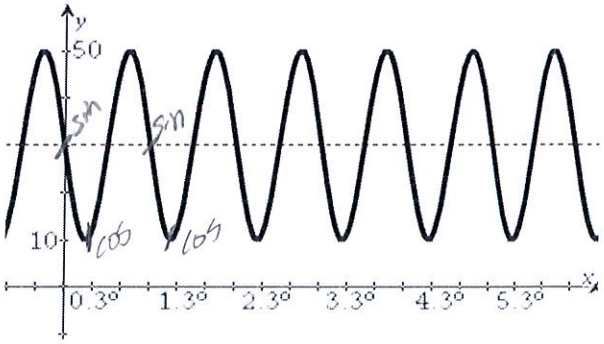


13.

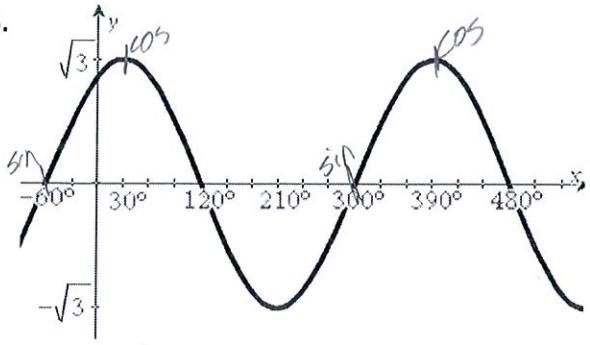


29 - -7 = 36°

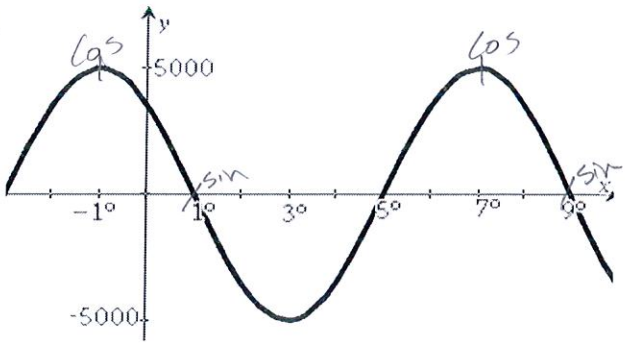
14.



15.



16.



Trig Graphing - ws 4

Equations:

$y = a\cos b(\theta - c) + d$

$y = a\sin b(\theta - c) + d$

amp → a; $\frac{2\pi}{\text{period}}$ or $\frac{360}{\text{period}}$ → b; phase shift → c; vs → d

$y = a\cos b(x - c) + d$

$y = a\sin b(x - c) + d$

*Answers may vary

1. amp = 3

period = $7\pi - -\pi = 8\pi$ $\quad b = \frac{2\pi}{8\pi} = \frac{1}{4}$

ps = $-\pi$

vs = 5

$y = 3\cos\frac{1}{4}(x + \pi) + 5$

$y = -3\sin\frac{1}{4}(x - \pi) + 5$

2. amp = 4

period = 22 − 2 = 20 $\quad b = \frac{2\pi}{20} = \frac{\pi}{10}$

ps = 2

vs = −3

$y = 4\cos\frac{\pi}{10}(x - 2) - 3$

$y = -4\sin\frac{\pi}{10}(x - 7) - 3$

3. amp = 2

period = $\frac{7\pi}{6} - \frac{\pi}{6} = \pi$ $\quad b = \frac{2\pi}{\pi} = 2$

ps = $\pi/6$

vs = 5

$y = 2\cos 2(x - \frac{\pi}{6}) + 5$

$y = 2\sin 2(x + \frac{\pi}{12}) + 5$

$y = -2\cos 2(x + \frac{\pi}{3}) + 5$

4. amp = .05

period = 7 − −1 = 8 $\quad b = \frac{2\pi}{8} = \frac{\pi}{4}$

ps = −1

vs = .25

$y = .05\cos\frac{\pi}{4}(x + 1) + .25$

$y = -.05\sin\frac{\pi}{4}(x - 1) + .25$

5. amp = 9

period = $\frac{\pi}{4}$

ps = 0

vs = 4

$y = 9\cos 8x + 4$ ← with phase shift

$y = 9\cos 8(x - \frac{\pi}{4}) + 4$ ← without phase shift

$b = \frac{2\pi}{\pi/4} = 2\pi \cdot \frac{4}{\pi} = 8$

6. amp = 2
period = .47 - .07 = .4
ps = .07
vs = −8

$b = \frac{2\pi}{.4} = 5\pi$

$y = -2\cos 5\pi(x - .07) - 8$

$y = 2\cos 5\pi(x + .13) - 8$

7. amp = 5
period = 25 − −5 = 30
ps = −5
vs = −2

$b = \frac{2\pi}{30} = \frac{\pi}{15}$

$y = 5\cos\frac{\pi}{15}(x + 5) - 2$

$y = -5\cos\frac{\pi}{15}(x - 10) - 2$

8. amp = 7.2
period = 1600
ps = 100
vs = −2.4

$b = \frac{2\pi}{1600} = \frac{\pi}{800}$

$y = 7.2\cos\frac{\pi}{800}(x - 100) - 2.4$

9. amp = 6
period = 180°
ps = 20°
vs = 9

$b = \frac{360°}{180°} = 2$

$y = 6\cos 2(\theta - 20°) + 9$

$y = -6\cos 2(\theta + 70°) + 9$

$y = 6\sin 2(\theta + 25°) + 9$

$y = -6\sin 2(\theta - 65°) + 9$

10. amp = 10
period = 40°
ps = 4
vs = 8

$b = \frac{360}{40} = 9$

$y = -10\cos 9(\theta - 4°) + 8$

$y = 10\cos 9(\theta + 16) + 8$

$y = 10\sin 9(\theta - 14°) + 8$

$y = -10\sin 9(\theta + 6°) + 8$

11. amp = 5
period = 120°
ps = 10°
vs = −3

$b = \frac{360}{120} = 3$

$y = 5\cos 3(\theta - 10°) - 3$

$y = -5\sin 3(\theta - 40°) - 3$

12. amp = 10
period = 20°
ps = 3
vs = −30

$b = \frac{360}{20} = 18$

$y = 10\cos 18(\theta - 3) - 30$

$y = 10\sin 18(\theta + 2°) - 30$

13. amp = 1.11
period = 29 − −7 = 36°
ps = −7
vs = 1.45

$b = \frac{360}{36} = 10$

$y = 1.11\cos 10(\theta + 7) + 1.45$

$y = -1.11\sin 10(\theta - 2°) + 1.45$

14. amp = 20
period = 1.3 − .3 = 1
ps = none
vs = 30

$b = \frac{360}{1} = 360$

$y = -20\sin 360\theta + 30$

$y = -20\cos 360(\theta - .3) + 30$

15. amp = $\sqrt{3}$
period = 360°
ps = −60°
vs = none

$b = \frac{360}{360} = 1$

$y = \sqrt{3}\sin(\theta + 60°)$

$y = \sqrt{3}\cos(\theta - 30°)$

16. amp = 5000
period = 7 − −1 = 8
ps = −1
vs = none

$b = \frac{360}{8} = 45°$

$y = 5000\cos 45°(\theta + 1)$

$y = -5000\sin 45(\theta - 1)$