Honors PreCalc '15-16 Name Solution Key
Chapter 2 Test--MC
Calculator NOT Allowed Score _____

1. Given $g(x)=3+2\sin\left[\frac{\pi}{4}(x+1)\right]$, which of the following statements is true?

The amplitude of $g(x)$ is 3. ✗
The period of $g(x)$ is 8. ✓
The phase shift is 1. ✗

(a) I only (b) II only (c) III only
(d) II and III only (e) I, II and III

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2. On the graph of $y=-\cos x$, as x increases on $x\in\left[-\frac{\pi}{4},\frac{\pi}{4}\right]$, the function y

(a) decreases (b) is constant (c) increases
(d) decreases, then increases (e) increases, then decreases

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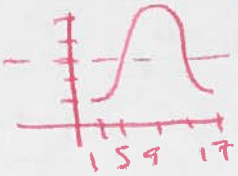
3. What is the smallest positive value where $y=3-2\cos\left[\frac{\pi}{8}(x-1)\right]$ has a point on the sinusoidal axis?

(a) 1 (b) 5 (c) 9 (d) 13 (e) 17



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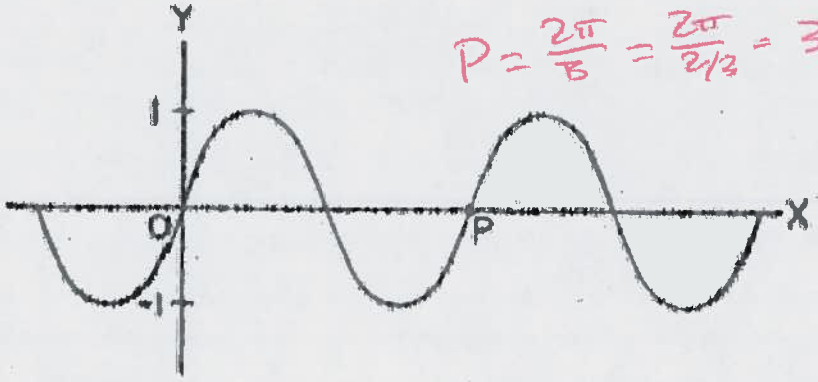
4. This is the graph of $y = \sin\left(\frac{2}{3}x\right)$.



$P = \frac{2\pi}{B} = \frac{2\pi}{2/3} = 3\pi$

What is the x-value of P?

(a) $\frac{\pi}{3}$ (b) $\frac{2\pi}{3}$ (c) 2π (d) 3π (e) 6π

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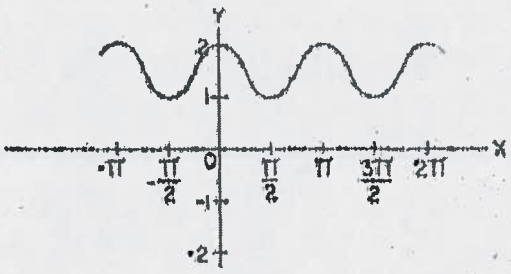
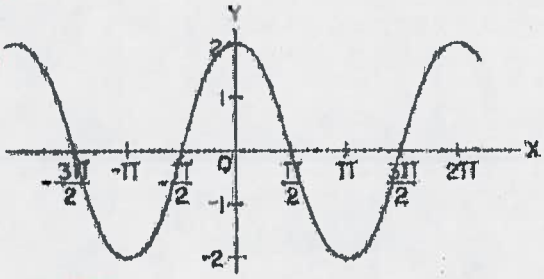
5. Which of the following is the graph of $y=1+\cos\left(x-\frac{\pi}{2}\right)$?

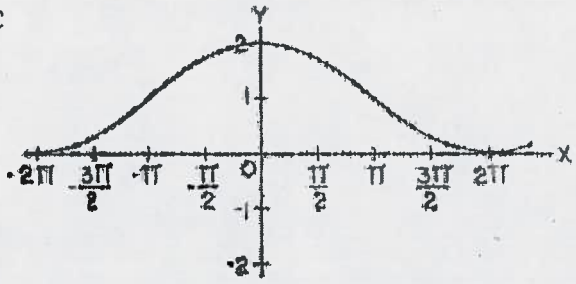
A



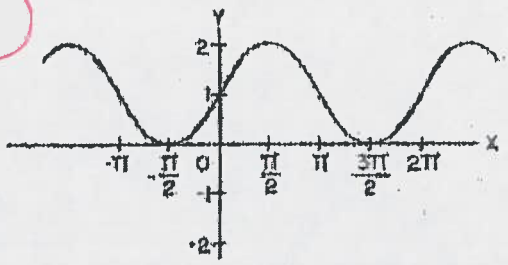
B



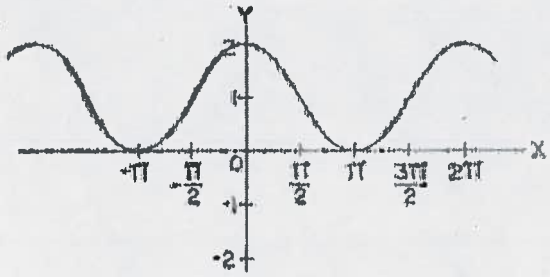
C



D



E



(a) A (b) B (c) C (d) D (e) E

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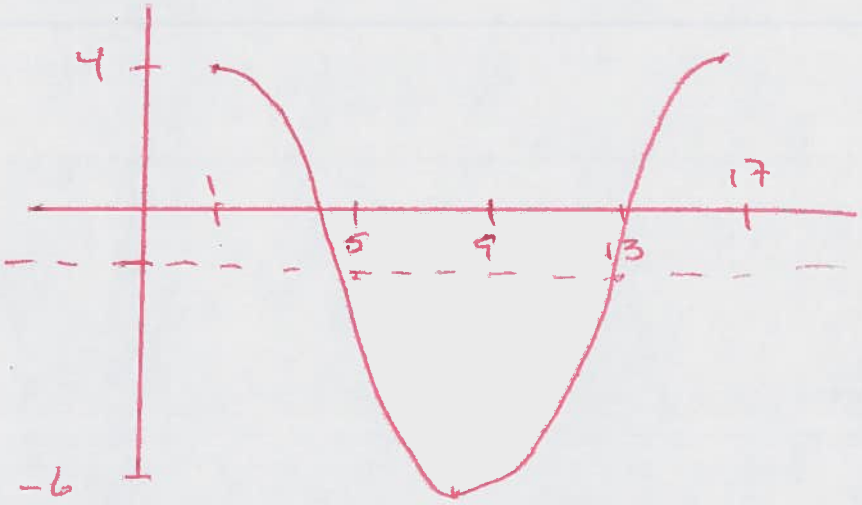
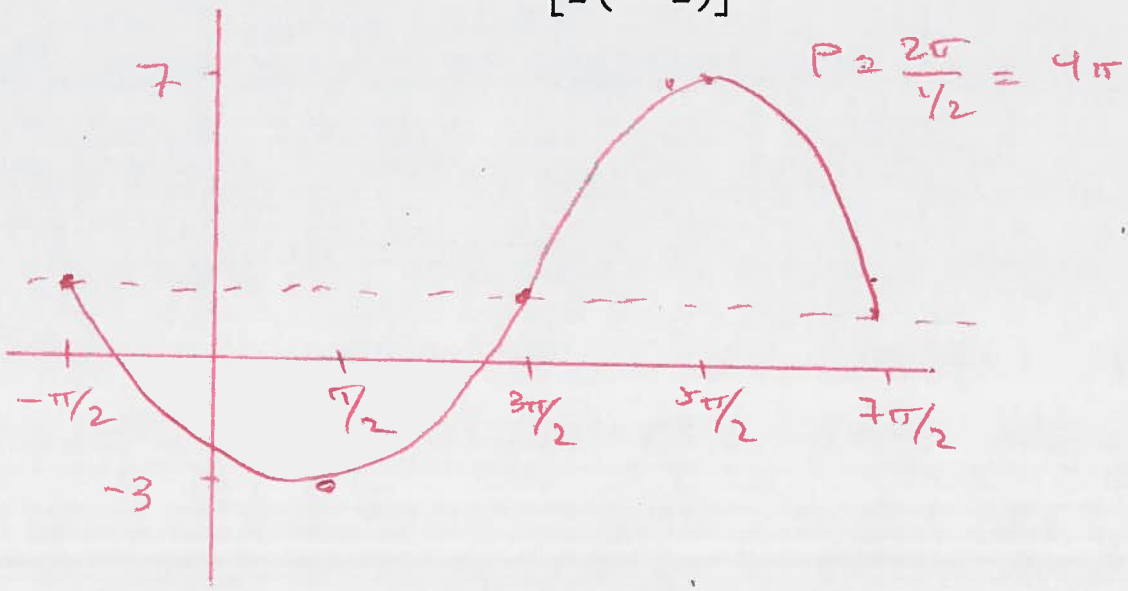
Calculator required Score _____
Round all answers to 3 decimals

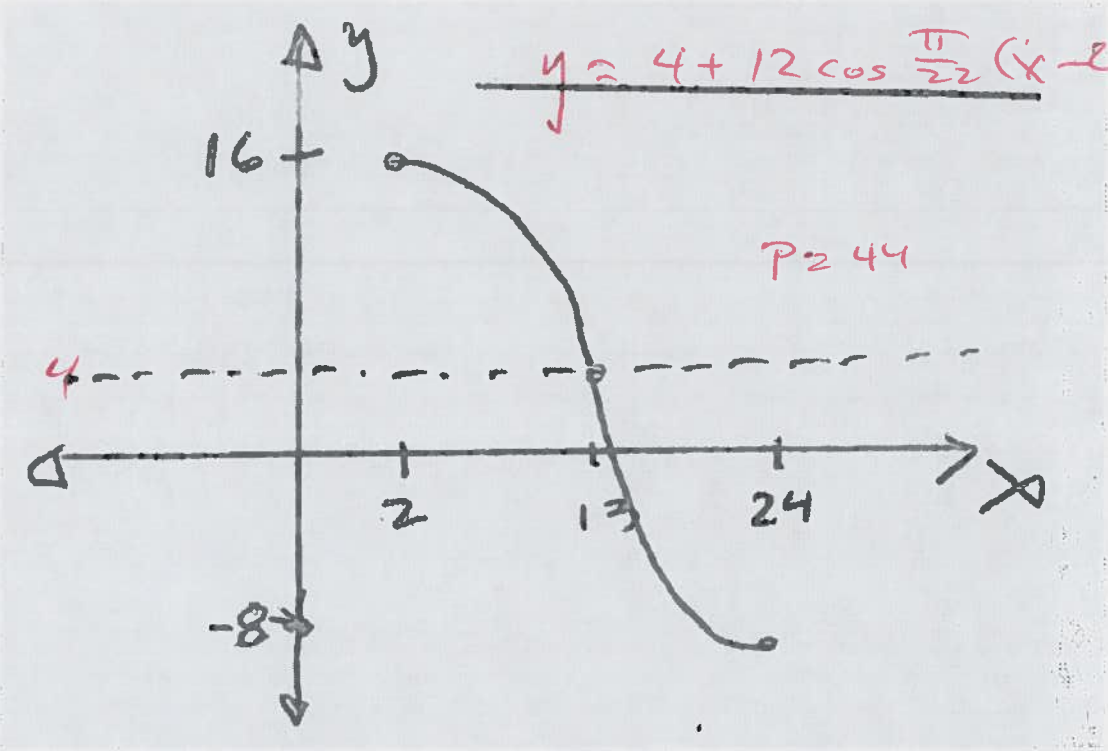
7. Sketch one cycle of $y=-1+5\cos\left[\frac{\pi}{8}(x-1)\right]$



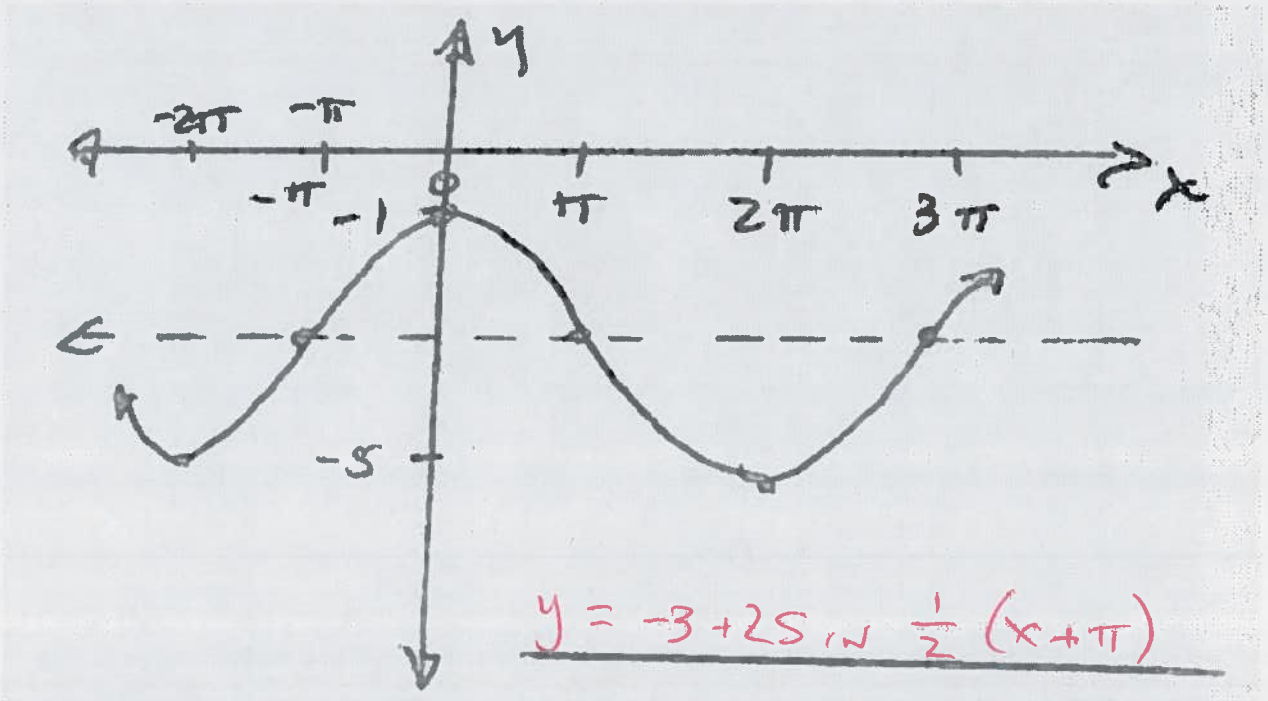
8. Sketch one cycle of $y=2-5\sin\left[\frac{1}{2}\left(x+\frac{\pi}{2}\right)\right]$



9. Find a cosine equation for this graph:



10. Find a sine equation for this graph:



11. If $H(x)=-1+4\cos\left[\frac{\pi}{3}(x-2)\right]$, find the first three negative values of x where $H(x)=2.3$.

$2.3 = -1 + 4\cos\frac{\pi}{3}(x-2)$

$3.3 = 4\cos\frac{\pi}{3}(x-2)$

$.825 = \cos\frac{\pi}{3}(x-2)$

$\left.\begin{matrix} .601 \pm 2\pi n \\ -.601 \pm 2\pi n \end{matrix}\right\} = \frac{\pi}{3}(x-2)$

$\left.\begin{matrix} .574 \pm 6n \\ -.574 \pm 6n \end{matrix}\right\} = x-2$

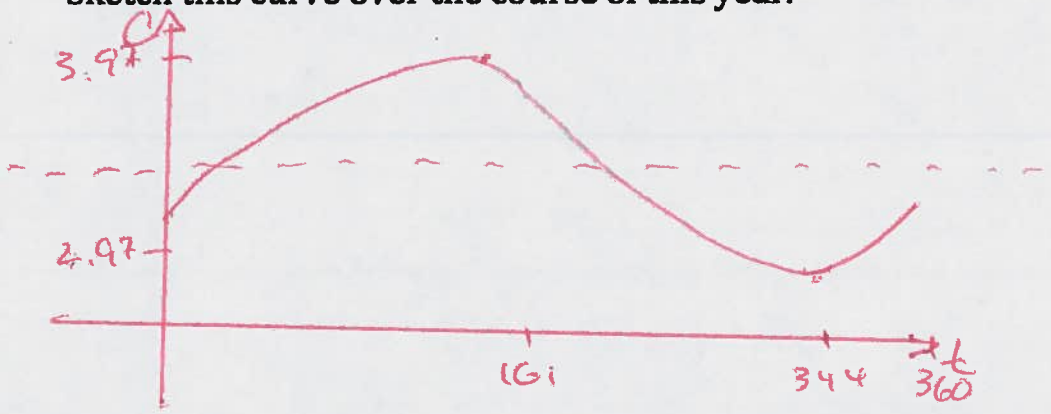
$x = \begin{cases} 2.574 \pm 6n \\ 11.426 \pm 6n \end{cases}$

$x = \cancel{11.426, 23.426}$

$x = -3.426, -4.574, -9.426$

12. The price of gasoline over the past year seems to have varied with time. On June 10th (day 161), the cost was its highest, which was $3.97. On December 10th (day 344), the cost was its lowest, which was $2.97.

a. Sketch this curve over the course of this year.



b. Write an equation for this sinusoid.

$$C = 3.47 + .5 \cos \frac{\pi}{183}(t - 161)$$

c. According to this model, what was the price on August 12th (day 214).

$C(214) \approx \$3.78$

d. When will the price of gas next rise above $3.10?

$$3.10 = 3.47 + .5 \cos\left(\frac{\pi}{183} t - 161\right)$$

$$-.37 = .5 \cos\left(\frac{\pi}{183} t - 161\right)$$

$$-.74 = \cos \frac{\pi}{183}(t - 161)$$

$$\left.\begin{matrix} 2.404 \pm 2\pi n \\ -2.404 \pm 2\pi n \end{matrix}\right\} = \frac{\pi}{183}(t - 161)$$

$$\left.\begin{matrix} 140.027 \pm 366n \\ -140.027 \pm 366n \end{matrix}\right\} = t - 161$$

$$\left.\begin{matrix} 301.027 \pm 366n \\ 20.973 \pm 366n \end{matrix}\right\} = t \qquad t = 301 \text{ DAY } 386$$