6.3: (Trigonometric Graphs)

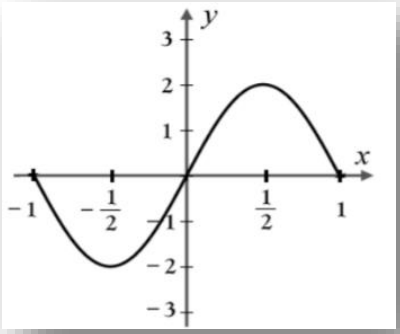
If $y = -2 - 3\sin\left(2x + \frac{2\pi}{3}\right)$, M is the maximum, P the period and S the phase shift then $M + \frac{P+S}{\pi}$ is equal to A) $\frac{7}{3}$ B) $\frac{-1}{3}$ C) $\frac{4}{3}$ D) $\frac{17}{3}$ E) $\frac{5}{3}$	Trigonometric Graphs ($\sin\theta$).
The graph of $y = -\sin(\pi x + \pi), -1 \leq x \leq 1$, is increasing on the interval: A) $\left(-\frac{1}{2}, \frac{1}{2}\right)$ B) $\left(-1, \frac{1}{2}\right)$ C) $\left(-\frac{1}{2}, 1\right)$ D) $(0,1)$ E) $\left(\frac{1}{2}, 1\right)$	Trigonometric Graphs ($\sin\theta$).
The graph of $y = -\frac{2}{3}\sin\frac{\pi}{4}x$, with $-8 \leq x \leq 0$, A) is above the x-axis on the interval $(-4,0)$ B) intersects the x-axis at two points C) has maximum value of $2/3$ in the interval $[-8,-4]$ D) is increasing on the intervals $(-8,-6)$ and $(-2,0)$ E) is decreasing on the interval $(-6,-2)$	Trigonometric Graphs ($\sin\theta$).

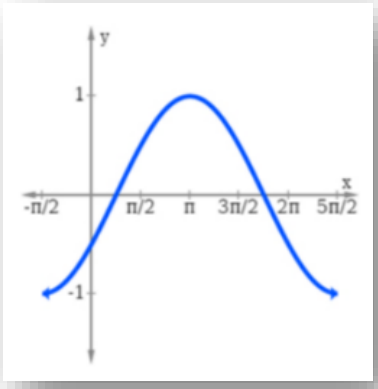
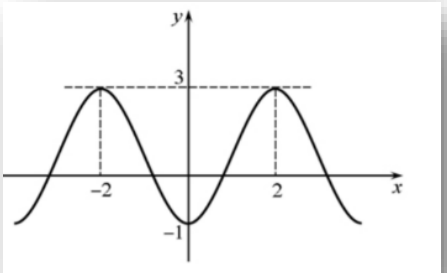
The graph of the function $f(x) = -3\sin\left(\frac{1}{3}x\right)$. with $0 \le x \le 6\pi$, lies completely below the x-axis on the interval (a) $(0,3\pi)$ (b) $(0, 6\pi)$ (c) $(3\pi, 6\pi)$ (d) $(4\pi, 6\pi)$ (e) $(\pi, 6\pi)$	Trigonometric Graphs ($\sin\theta$).
Which one of the following statements is FALSE? A) $f(x) = x + \cos x \sin x$ is an odd function. B) If $\frac{\pi}{2} < x < \pi$, then $\sin x - \cos x > 0$. C) $f(x) = \cos x \sin^2 x$ is an odd function. D) $f(x) = 3 + \cos x$ is an even function. E) The period of the function $f(x) = -\sin(2\pi x)$ is 1	Trigonometric Graphs ($\sin\theta$).
The graph of the function $y = 3\sin\|x\|, -\pi \le x \le \frac{\pi}{2}$, is decreasing on the interval A) $(-\pi, 0)$ B) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ C) $\left(-\frac{\pi}{2}, 0\right)$ D) $\left(-\pi, -\frac{\pi}{2}\right)$ E) $\left(0, \frac{\pi}{2}\right)$	Trigonometric Graphs ($\sin\theta$).

The graph of the function $f(x) = -3\sin\left(\frac{\pi}{2} - 2x\right), \frac{\pi}{4} \leq x \leq \frac{5\pi}{4}$ is below the x - axis on A) $\left(\frac{3\pi}{4}, \frac{5\pi}{4}\right)$ B) $\left(\frac{\pi}{2}, \pi\right)$ C) $\left(\frac{\pi}{2}, \frac{3\pi}{4}\right)$ D) $\left(\frac{\pi}{4}, \pi\right)$ E) $\left(\frac{\pi}{4}, \frac{\pi}{2}\right)$	Trigonometric Graphs ($\sin\theta$).
The range of the function $f(x) = 1 + \sqrt{4 - 4\sin^2 x}$, is A) [1,5] B) [0,2] C) $[-1,3]$ D) [1,3] E) $[-3,5]$	Trigonometric Graphs ($\sin\theta$).
If the range of the function $y = K - 5\sin\left(\frac{\pi}{2}x - \frac{\pi}{2}\right)$ is $[-7,3]$, then $K =$ A) -2 B) $\pi + 2$ C) 0 D) 4 E) $2 - \pi$	Trigonometric Graphs ($\sin\theta$).

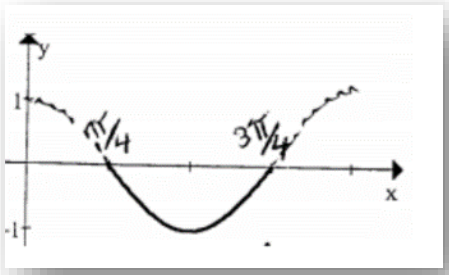
The graph of $y = 3\sin\|\pi x\|$, with $-1 \le x \le 1$, is increasing on the interval A) $\left(-1, -\frac{1}{2}\right) \cup \left(0, \frac{1}{2}\right)$ B) $\left(-\frac{1}{2}, 0\right) \cup \left(\frac{1}{2}, 1\right)$ C) $\left(-1, \frac{1}{2}\right)$ D) $\left(-\frac{1}{2}, \frac{1}{2}\right)$ E) $\left(-\frac{1}{2}, 1\right)$	Trigonometric Graphs ($\sin\theta$).
Which one of the following statements is FALSE about the graph of the function $f(x) = -\frac{1}{2}\sin\left(\frac{\pi x}{2}\right), -2 \le x \le 2$? A) is increasing on the interval $(-1,1)$. B) has three x-intercepts. C) lies above the x-axis on the interval $(-2,0)$. D) lies below the x-axis on the interval $(0,2)$. E) passes through the origin.	Trigonometric Graphs ($\sin\theta$).
The graph of the function $f(x) = 2\sin(4x + \pi)$, where $-\frac{\pi}{4} \le x \le \frac{\pi}{4}$, A) has three x-intercepts B) has no y-intercept C) is increasing on the interval $\left(-\frac{\pi}{8}, \frac{\pi}{8}\right)$ D) is below the x-axis in the interval $\left(-\frac{\pi}{4}, 0\right)$ E) is above the x-axis in the interval $\left(0, \frac{\pi}{4}\right)$	Trigonometric Graphs ($\sin\theta$).

Which one of the following statements is TRUE about the function $f(x) = -1 + \frac{1}{2}\sin(2x - 3\pi)$? A) The range of the function is $\left[-\frac{3}{2}, -\frac{1}{2}\right]$ B) The vertical translation of the graph of the function is $\frac{1}{2}$ unit up C) The period of the function is 2π D) The phase shift of the function is 3π unit to the right E) The amplitude of the function is $\frac{3}{2}$	Trigonometric Graphs ($\sin\theta$).
The graph of $y = \frac{5}{2} - \cos\left[3\left(x - \frac{\pi}{6}\right)\right]$ has: A) range $\left[\frac{3}{2}, \frac{7}{2}\right]$ B) period π C) phase shift $\frac{\pi}{2}$ to the left D) amplitude 3 E) y-intercept $-\frac{5}{2}$	Trigonometric Graphs ($\cos\theta$).
The number of x-intercepts of the graph of $y = -2\cos\pi x, -\frac{3}{2} \leq x < \frac{5}{2}$. is A) 5 B) 1 C) 3 D) 4 E) 2	Trigonometric Graphs ($\cos\theta$).

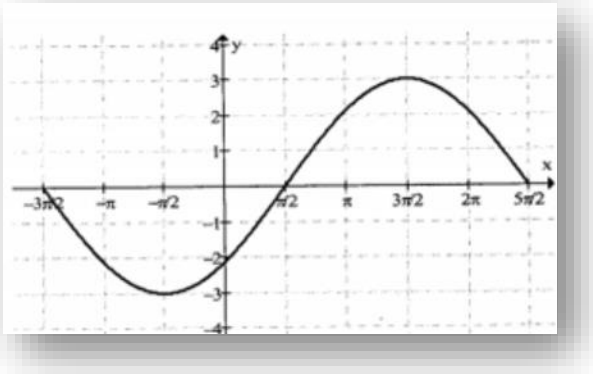
The range of the function $y = 2 - \lvert 3\cos(3x - \pi)\rvert$, is A) $[-1,2]$ B) $[-3,0]$ C) $(-\infty,-3] \cup [0,\infty)$ D) $[1,4]$ E) $(-\infty,1] \cup [4,\infty)$	Trigonometric Graphs ($\cos\theta$).
If the adjacent figure represents the graph of $y = -2\cos(bx + c)$, then A) $b = \pi$ and $c = \frac{\pi}{2}$ B) $b = \pi$ and $c = -\frac{\pi}{2}$ C) $b = 2\pi$ and $c = -\frac{\pi}{4}$ D) $b = 2\pi$ and $c = \frac{\pi}{4}$ E) $b = \pi$ and $c = \frac{\pi}{4}$ 	Trigonometric Graphs ($\cos\theta$).
The graph of the function $f(x) = 3\cos(2\pi x)$ over $[-1,1]$ intersects the line $y = -2$ at A) 5 points B) 7 points C) 8 points D) 3 points E) 4 points	Trigonometric Graphs ($\cos\theta$).

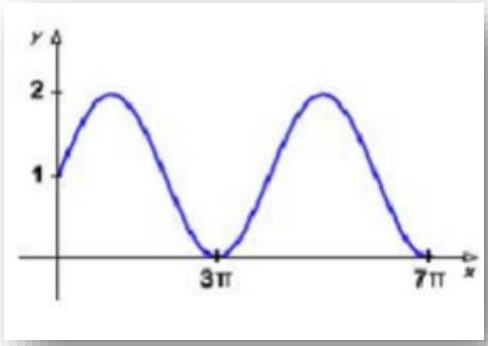
The graph of the function $f(x) = -2\cos\left(\frac{\pi}{4}x - \frac{\pi}{2}\right), 0 \le x \le 10$ is increasing on the interval A) [2,6] B) [0,4] C) [0,4] ∪ [8,10] D) [8,10] E) [3,4] ∪ [9,10]	Trigonometric Graphs ($\cos\theta$).
If the adjacent figure represents the graph of the function $y = a\cos(kx + b)$, then $a + k + \frac{b}{\pi} =$ A) 0 B) 1 C) -1 D) $\frac{\pi-1}{2}$ E) $\frac{\pi^2-1}{2}$ 	Trigonometric Graphs ($\cos\theta$).
If the adjacent figure represents the graph of $y = a\cos(bx) + 1$, then $2b - \pi a =$ A) 3π B) 2π C) -2π D) -3π E) π 	Trigonometric Graphs ($\cos\theta$).

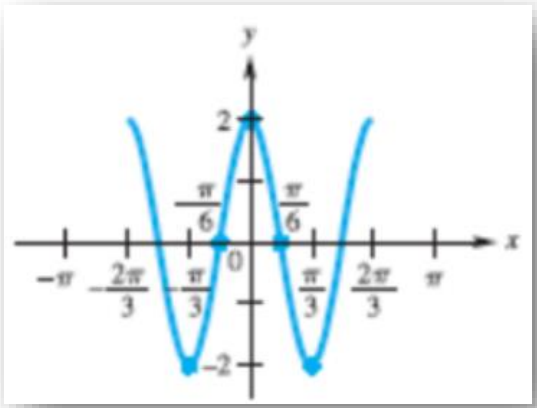
If the graph of the function $f(x) = 2\cos(bx + c), b > 0$ and $-\frac{\pi}{2} \leq c \leq \frac{\pi}{2}$, has period $\frac{2\pi}{3}$ and passes through the point $(0,2)$, then $b + c =$ A) 3 B) 0 C) 4 D) 5 E) 2	Trigonometric Graphs ($\cos\theta$).
The range of the function $f(x) = 3 - \lvert\cos(x - \pi)\rvert$ is A) [2,3] B) [2,4] C) $[-3,3]$ D) (2,4) E) (2,3)	Trigonometric Graphs ($\cos\theta$).
Which one of the following statements is FALSE about the function $f(x) = 5\cos\left(3x - \frac{\pi}{4}\right)$? (a) The graph of $f(x)$ has y-intercept at $y = -1$ (b) The range of $f(x)$ is $[-5,5]$ (c) The horizontal shift of the graph of $f(x)$ is $\frac{\pi}{12}$ units to the right (d) The amplitude of the graph of $f(x)$ is 5 (c) The period of $f(x)$ is $\frac{2\pi}{3}$	Trigonometric Graphs ($\cos\theta$).

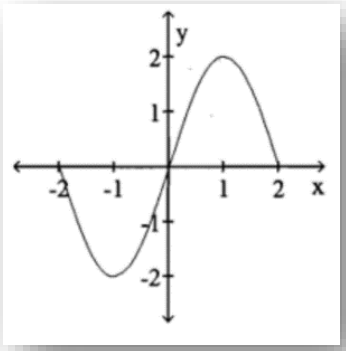
The graph of the function $f(x) = -2\sin(3x)$ over $[0,2\pi]$ intersects the line $y = \frac{3}{2}$ at A) 3 points. B) 7 points. C) 6 points. D) 2 points. E) 5 points	Trigonometric Graphs ($\sin\theta$).
The equation of the function whose part of its graph is drawn below is A) $y = -\cos 4x$ B) $y = -\sin 3x$ C) $y = -\sin 2x$ D) $y = \cos 2x$ E) $y = -\cos 2x$ 	Trigonometric Graphs ($\cos\theta$).
If A is the amplitude, P is the period and F is the phase shift of the graph of the function $f(x) = -3\cos\left(\frac{\pi x}{5} - 2\pi\right)$, then $\frac{-2A+P-F}{2} =$ A) $-3 - 10\pi$ B) -3 C) 3 D) $3 + 10\pi$ E) $-3 + 10\pi$	Trigonometric Graphs ($\cos\theta$).
The range R and the period P of the function $y = -\left\|3\sin\frac{x}{2}\right\|$ are given by (a) $R = [-3,0],\ P = 2\pi$ (b) $R = [-3,3],\ P = 2\pi$ (c) $R = [-3,0],\ P = 4\pi$ (d) $R = [-3,0],\ P = \pi$ (e) $R = [-3,0],\ P = \frac{\pi}{2}$	Trigonometric Graphs ($\sin\theta$).

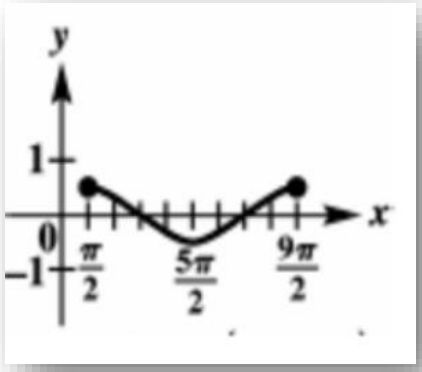
The graph of $y = -\frac{1}{2}\sin \pi x$ A) has a maximum of $\frac{1}{2}$ in the interval $[3,4]$ B) is decreasing on the interval $[1,2]$ C) is increasing on the interval $[0,1]$ D) has a minimum of $-\frac{1}{2}$ in the interval $[-1,0$ E) has a minimum of $-\frac{1}{2}$ in the interval $[1,2]$	Trigonometric Graphs ($\sin\theta$).
The number of points of intersection of $y = 1$ and $y = -2\sin\frac{\pi x}{3}$ in the interval $[-3,9]$ A) 2 B) 4 C) 5 D) 3 E) 6	Trigonometric Graphs ($\sin\theta$).
Let $f(x) = -\frac{1}{3}\cos(2\pi x)$ and A be its amplitude, P be its period and (a, b) be the highest point of the function in the interval $[0,1]$. Then, $A + P + a - b =$ A) $\frac{3}{2}$ B) $\frac{5}{2}$ c) $\frac{3\pi}{2}$ D) $1 + \frac{3\pi}{2}$ E) $\frac{5\pi-1}{2}$	Trigonometric Graphs ($\cos\theta$).

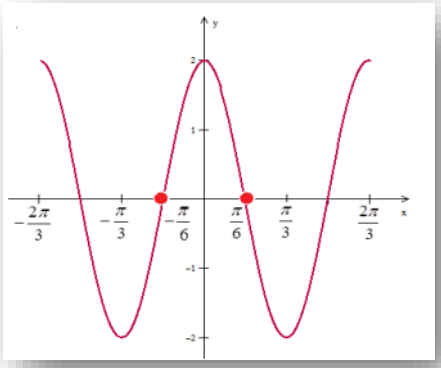
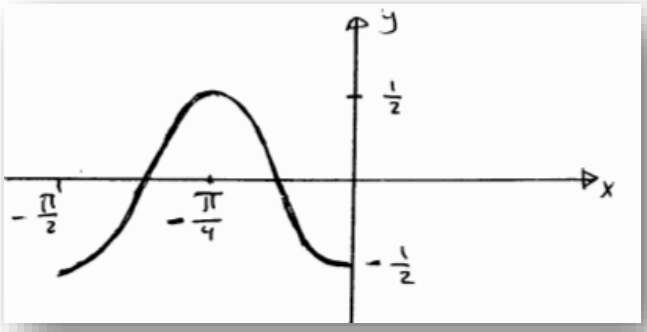
The range of the function $f(x) = -\left\|3\sin\frac{2x}{3}\right\|$ is A) $[-3,0]$ B) $[0,3]$ C) $[-3,3]$ D) $[-1,0]$ E) $[-1,1]$	Trigonometric Graphs ($\sin\theta$).
The function $y = \cos\left(\frac{x}{3} - \frac{\pi}{3}\right)$, for $-\frac{13\pi}{2} \le x \le \frac{17\pi}{2}$ has A) three maximum values B) two maximum values C) four maximum values D) five maximum values E) six maximum values	Trigonometric Graphs ($\sin\theta$).
If the adjacent figure represents the graph of the function $y = a\sin(bx + c)$, $-\frac{3\pi}{2} \le x \le \frac{5\pi}{2}$, then A) $a = -3, b = \frac{1}{2}, c = \frac{3\pi}{4}$ B) $a = -3, b = 2, c = -\frac{3\pi}{2}$ C) $a = 3, b = \frac{1}{2}, c = -\frac{3\pi}{4}$ D) $a = 3, b = 4, c = 3\pi$ E) $a = -3, b = \frac{1}{4}, c = \frac{3\pi}{8}$ 	Trigonometric Graphs ($\sin\theta$).

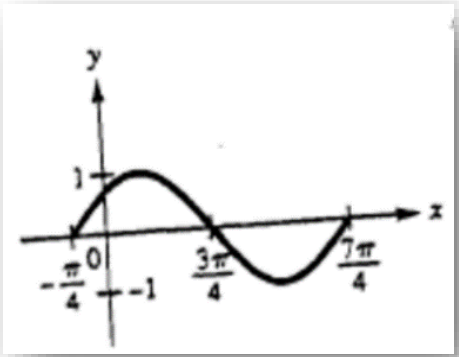
The graph of the function $y = \frac{1}{2}\cos\frac{\pi}{2}x$ increases over the interval A) (2,4) B) (0,2) C) (3,5) D) (1,3) E) (2,5)	Trigonometric Graphs ($\cos\theta$).
The adjacent figure represents part of the graph of A) $y = \sin\left(\frac{1}{2}x\right) + 1$ B) $y = \cos\left(\frac{1}{2}x\right) + 1$ C) $y = 2\sin(x) + 1$ D) $y = 2\cos(x) + 1$ E) $y = \sin(2x) + 1$ 	Trigonometric Graphs ($\sin\theta$).
The graph of $y = -\lvert\sin\pi x\rvert$ over the interval $\left[\frac{1}{2}, \frac{3}{2}\right]$ intersects the line $y = -\frac{1}{2}$ at: (a) 2 points (b) 1 point (c) 3 points (d) 4 points (e) no point	Trigonometric Graphs ($\sin\theta$).

If the adjacent figure represents the graph of the function $y = a\cos(bx + c), -\frac{2\pi}{3} \leq x \leq \frac{2\pi}{3}$ then  A) $a = -2, b = 3, c = \pi$ B) $a = 2, b = \frac{1}{3}, c = \pi$ C) $a = -2, b = 3, c = -\frac{2\pi}{3}$ D) $a = -2, b = \frac{2}{3}, c = \frac{2\pi}{3}$ E) $a = 2, b = \frac{2}{3}, c = \frac{\pi}{3}$	Trigonometric Graphs ($\cos\theta$).
Over the interval $\left[-\frac{\pi}{4}\frac{15\pi}{4}\right)$, the function $y = -\sin\left(\frac{x}{2} + \frac{\pi}{8}\right)$ is decreasing on the interval(s) A) $\left[-\frac{\pi}{4}, \frac{3\pi}{4}\right]$ and $\left[\frac{11\pi}{4}, \frac{15\pi}{4}\right]$ B) $\left[\frac{3\pi}{4}, \frac{11\pi}{4}\right]$ C) $\left[-\frac{\pi}{4}, \frac{5\pi}{4}\right]$ and $\left[\frac{11\pi}{4}, \frac{15\pi}{4}\right]$ D) $\left[0, \frac{3\pi}{4}\right]$ and $\left[\frac{5\pi}{4}, \frac{11\pi}{4}\right]$ E) $\left[-\frac{\pi}{4}, \frac{3\pi}{4}\right]$ and $\left[\frac{7\pi}{4}, \frac{11\pi}{4}\right]$	Trigonometric Graphs ($\sin\theta$).

The function $y = -2 + 5\cos(2x + 3\pi)$ has A) range $= [-7,3]$, phase shift $= \frac{3\pi}{2}$ units to the left B) range $= [-5,5]$ phase shift $= 3\pi$ units to the left C) range $= [-7,3]$ phase shift $= \frac{3\pi}{2}$ units to the right D) range $= [-2,2]$, phase shift $= 3\pi$ units to the right E) range $= [-7,7]$, phase shift $= \frac{3\pi}{2}$ units to the left	Trigonometric Graphs ($\cos\theta$).
$y = -2\cos(bx + c)$, then A) $b = \frac{\pi}{2}$ and $c = \frac{\pi}{2}$ B) $b = \frac{\pi}{2}$ and $c = \frac{\pi}{4}$ C) $b = \pi$ and $c = +\frac{\pi}{2}$ D) $b = 2n$ and $c = -\frac{\pi}{4}$ E) $b = 2\pi$ and $c = -\pi$ 	Trigonometric Graphs ($\cos\theta$).
Which one of the following statements is TRUE? A) The equation $\sin x = 2$ has no solution in the interval $\frac{\pi}{2} \leq x \leq \frac{3\pi}{2}$. B) Domain of $y = \sin(x + \pi)$ is $[-\pi, \infty)$. C) The period of the graph of $y = \sin[\pi(2x - 1)]$ is π. D) The range of the function $y = 2\sin(x - \pi) - 1$ is $[-2,2]$. E) $(\sec x)(\sin x) = 1$.	Trigonometric Graphs ($\sin\theta$).

$y = \frac{1}{2}\cos(bx + c), \frac{\pi}{2} \leq x \leq \frac{9\pi}{2}$ then A) $b = \frac{1}{2}, c = -\frac{\pi}{4}$ B) $b = \frac{1}{2}, c = -\frac{\pi}{2}$ C) $b = 2, c = -\frac{\pi}{2}$ D) $b = \frac{1}{4},\ c = \frac{\pi}{2}$ E) $b = \frac{1}{4},\ c = \frac{\pi}{4}$ 	Trigonometric Graphs ($\cos\theta$).
The graph of the function $y = 2\sin\frac{1}{4}x$, for $-8\pi \leq x \leq 8\pi$, has A) two maximum values and five x-intercepts B) three maximum values and four x-intercepts C) four maximum values and three x-intercepts D) five maximum values and two x-intercepts E) three maximum values and three x-intercepts	Trigonometric Graphs ($\sin\theta$).
For $-8 \leq x \leq 8$, the graph of the function $y = -\frac{3}{2}\sin\left(\frac{\pi}{4}x\right)$ lies below the x-axis in the interval(s) [Hint: Sketch the graph] A) $(-8,-4)$ and $(0,4)$ B) $(-4,0)$ and $(4,8)$ C) $(-6,-2)$ and $(2,6)$ D) $(-4,0)$ and $(0,4)$ E) $(-4,4)$	Trigonometric Graphs ($\sin\theta$).

The graph of the function $y = 3\cos\left(\frac{1}{2}x - \frac{\pi}{4}\right)$, on the interval $\left[-\frac{7\pi}{2}, \frac{9\pi}{2}\right]$ intersects the line $y = 2$ at A) four points B) six points C) three points D) five points E) no points	Trigonometric Graphs ($\cos\theta$).
$y = -2\cos(bx + c), -\frac{2\pi}{3} \leq x \leq \frac{2\pi}{3}$ and $b > 0$, then A) $b = 3, c = \pi$ B) $b = \frac{1}{3}, c = \pi$ C) $b = 3, c = -\frac{2\pi}{3}$ D) $b = \frac{2}{3}, c = \frac{2\pi}{3}$ E) $b = \frac{2}{3}, c = \frac{\pi}{3}$ 	Trigonometric Graphs ($\cos\theta$).
If the adjacent figure represents the graph of $y = a\cos(bx + c)$ over one period where $0 < c \leq 2\pi$ and $a < 0$, then $8a + b + c =$ A) 2π B) -2π C) $\frac{\pi}{2}$ D) $-\pi$ E) π 	Trigonometric Graphs ($\cos\theta$).

The graph of $y = -4\sin(2x - \pi)$ is below x-axis on the interval : A) $\left(\frac{\pi}{2}, \pi\right)$ B) $(0, \pi)$ C) $\left(-\pi, -\frac{\pi}{2}\right)$ D) $\left(0, \frac{\pi}{2}\right)$ E) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$	Trigonometric Graphs ($\sin\theta$).
The adjacent graph represents a part of the graph of A) $y = \sin\left(x + \frac{\pi}{4}\right)$ B) $y = \sin\left(x - \frac{\pi}{4}\right)$ C) $y = \cos\left(x + \frac{\pi}{4}\right)$ D) $y = 1 - \cos\left(x - \frac{\pi}{4}\right)$ E) $y = -1 - \sin\left(x - \frac{\pi}{4}\right)$ 	Trigonometric Graphs ($\sin\theta$).
If $f(x) = a\sin bx, b > 0$ has a period of $\frac{2\pi}{3}$ and $f\left(\frac{\pi}{2}\right) = 2$, then a is: A) -2 B) 2 C) 2π D) $-\pi$ E) π	Trigonometric Graphs ($\sin\theta$).

The graph of $y = \frac{5}{2} - \cos\left[3\left(x - \frac{\pi}{6}\right)\right]$ has: A) range $\left[\frac{3}{2}, \frac{7}{2}\right]$ B) period π C) phase shift $\frac{\pi}{2}$ to the left. D) amplitude 3 E) y-intercept $-\frac{5}{2}$	Trigonometric Graphs ($\cos\theta$).
The range of the function $f(x) = 2 - \left\lvert\cos\left(-\frac{\pi x}{4}\right)\right\rvert$ is equal to: A) $[1,\ 2]$ B) $[0,\ 1]$ C) $[2,\ 3]$ D) $[-1,\ 0]$ E) $[-2,\ 0]$	Trigonometric Graphs ($\cos\theta$).