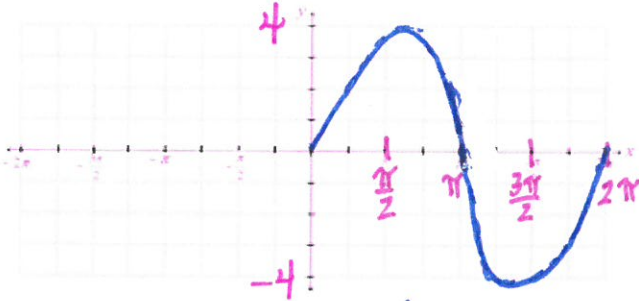
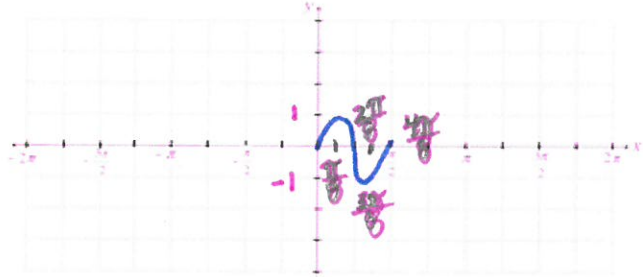


Find the amplitude and the period and sketch the graph of the equation.

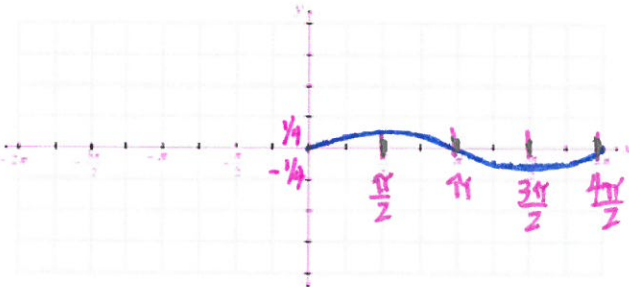
1. (a) $y = 4 \sin x$
 amp: 4
 per: 2π



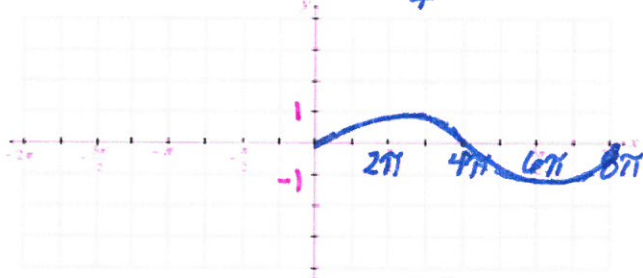
(b) $y = \sin 4x$
 amp: 1
 per: $\frac{2\pi}{4} = \frac{\pi}{2}$



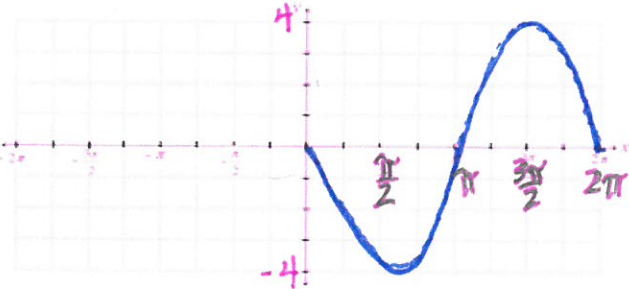
(c) $y = \frac{1}{4} \sin x$
 amp: $\frac{1}{4}$
 per: 2π



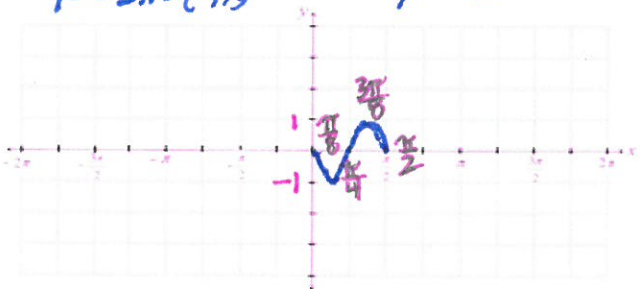
(d) $y = \sin \frac{1}{4}x$
 amp: 1
 per: $\frac{2\pi}{1/4} = 8\pi$



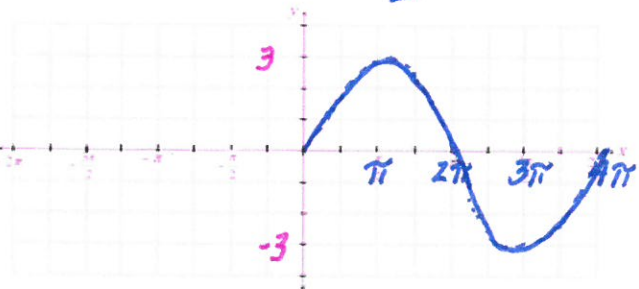
(e) $y = -4 \sin x$
 amp: $|-4| = 4$
 per: 2π



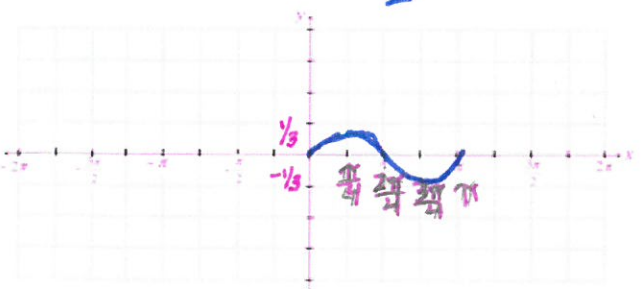
(f) $y = \sin(-4x)$
 $y = -\sin(4x)$
 amp: $|-1| = 1$
 per: $\frac{2\pi}{4} = \frac{\pi}{2}$



(g) $y = 3 \sin \frac{1}{2}x$
 amp: 3
 per: $\frac{2\pi}{1/2} = 4\pi$



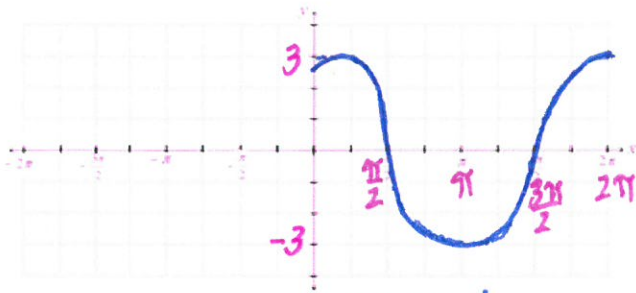
(h) $y = \frac{1}{3} \sin 2x$
 amp: $\frac{1}{3}$
 per: $\frac{2\pi}{2} = \pi$



Find the amplitude and the period and sketch the graph of the equation.

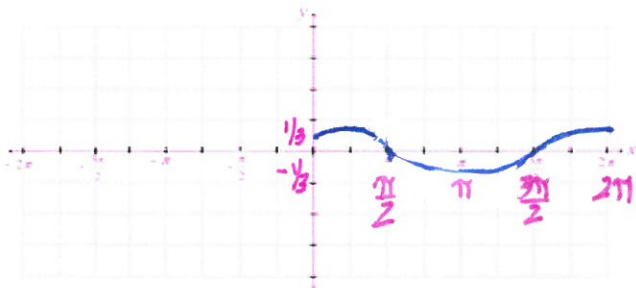
2. (a) $y = 3 \cos x$

amp: 3
per: 2π



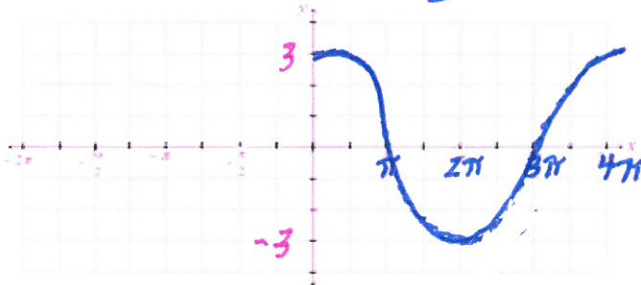
(c) $y = \frac{1}{3} \cos x$

amp: $\frac{1}{3}$
per: 2π



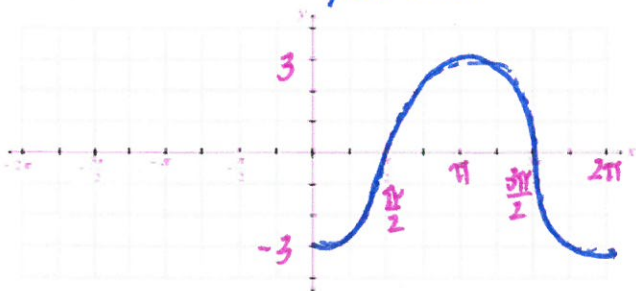
(e) $y = 3 \cos \frac{1}{2}x$

amp: 3
per: $\frac{2\pi}{1/2} = 4\pi$



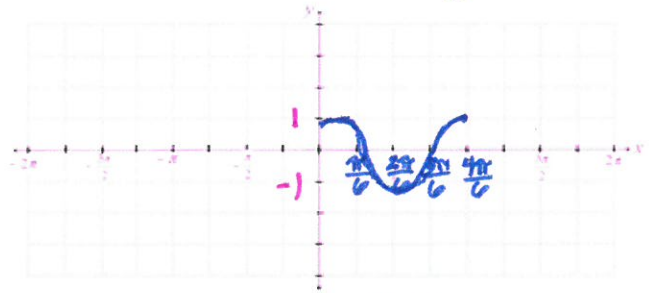
(g) $y = -3 \cos x$

amp: $|-3| = 3$
per: 2π



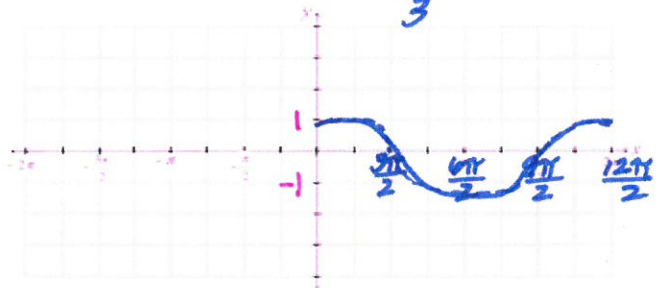
(b) $y = \cos 3x$

amp: 1
per: $\frac{2\pi}{3}$



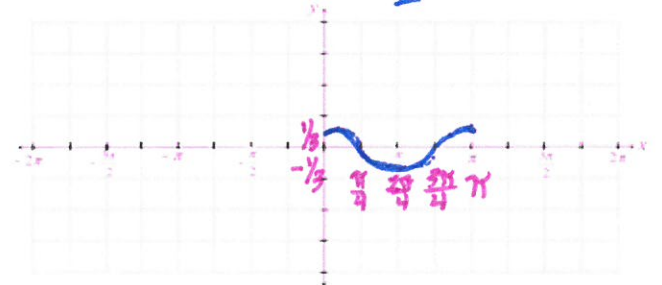
(d) $y = \cos \frac{1}{3}x$

amp: 1
per: $\frac{2\pi}{1/3} = 6\pi$



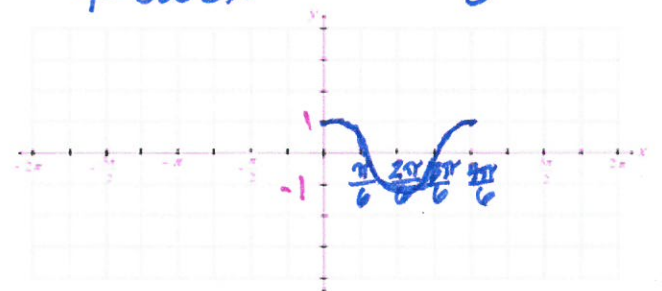
(f) $y = \frac{1}{3} \cos 2x$

amp: $\frac{1}{3}$
per: $\frac{2\pi}{2} = \pi$



(g) $y = \cos(-3x)$
 $y = \cos 3x$

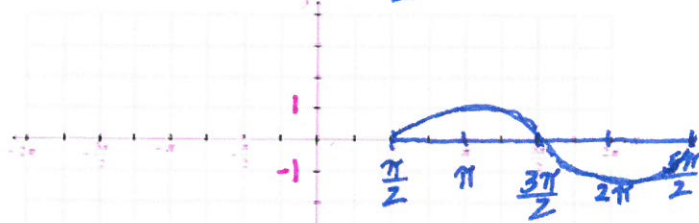
amp: 1
per: $\frac{2\pi}{3}$ (same as b)



Find the amplitude, the period, and the phase shift and sketch the graph of the equation.

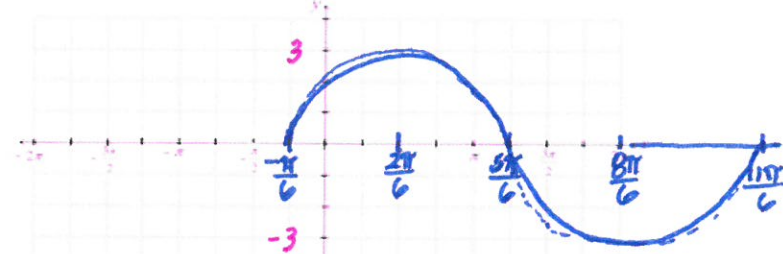
3. $y = \sin(x - \frac{\pi}{2})$

amp: 1 $0 \leq x - \frac{\pi}{2} \leq 2\pi$
 per: 2π
 p.s.: $\frac{\pi}{2}$ $\frac{\pi}{2} \leq x \leq \frac{5\pi}{2}$



4. $y = 3 \sin(x + \frac{\pi}{6})$

$0 \leq x + \frac{\pi}{6} \leq 2\pi$
 $-\frac{\pi}{6} \leq x \leq \frac{11\pi}{6}$
 amp: 3
 per: 2π
 p.s.: $-\frac{\pi}{6}$



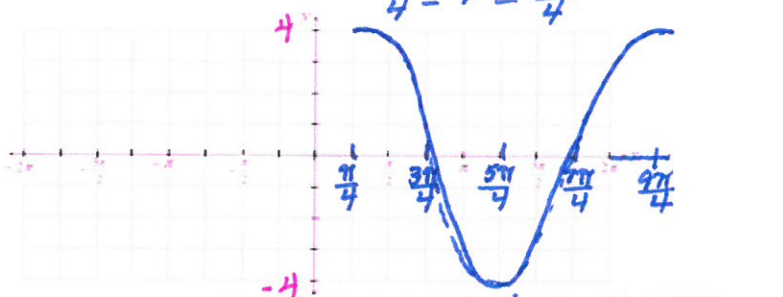
5. $y = \cos(x + \frac{\pi}{2})$

amp: 1; per: 2π ; p.s.: $-\frac{\pi}{2}$
 $0 \leq x + \frac{\pi}{2} \leq 2\pi$;
 $-\frac{\pi}{2} \leq x \leq \frac{3\pi}{2}$



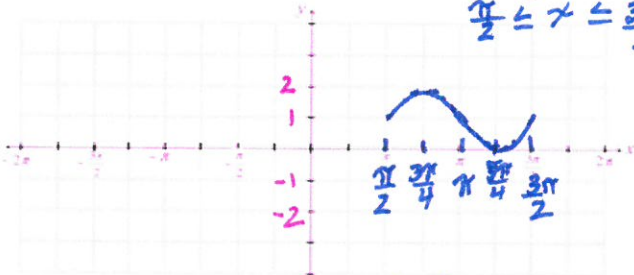
6. $y = 4 \cos(x - \frac{\pi}{4})$

amp: 4; per: 2π ; p.s.: $\frac{\pi}{4}$
 $0 \leq x - \frac{\pi}{4} \leq 2\pi$
 $\frac{\pi}{4} \leq x \leq \frac{9\pi}{4}$



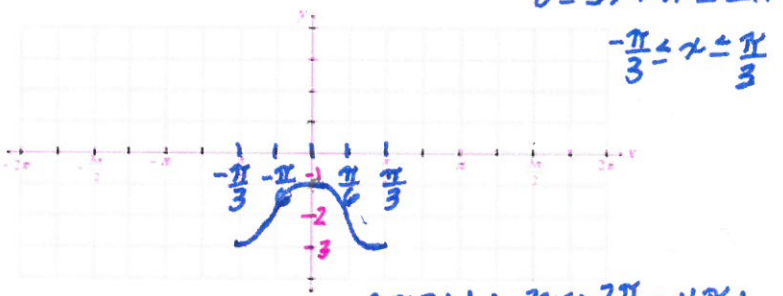
7. $y = \sin(2x - \pi) + 1$

amp: 1; per: $\frac{2\pi}{2} = \pi$;
 p.s.: $\frac{\pi}{2}$; v. shift: 1
 $0 \leq 2x - \pi \leq 2\pi$
 $\frac{\pi}{2} \leq x \leq \frac{3\pi}{2}$



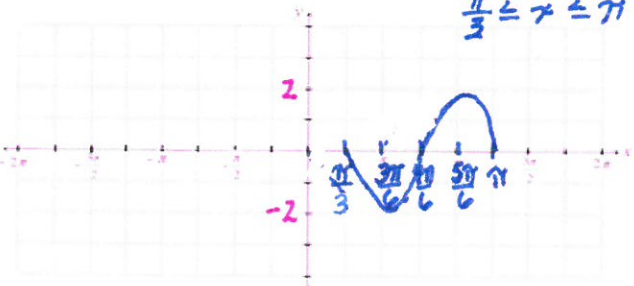
8. $y = -\cos(3x + \pi) - 2$

amp: $|-1| = 1$; per: $\frac{2\pi}{3}$
 p.s.: $-\frac{\pi}{2}$; v. shift: -2
 $0 \leq 3x + \pi \leq 2\pi$
 $-\frac{\pi}{3} \leq x \leq \frac{\pi}{3}$



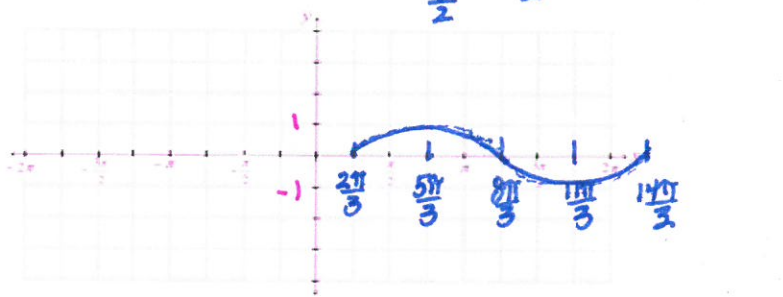
9. $y = -2 \sin(3x - \pi)$

amp: $|-2| = 2$; per: $\frac{2\pi}{3}$
 p.s.: $\frac{\pi}{3}$ $0 \leq 3x - \pi \leq 2\pi$
 $\frac{\pi}{3} \leq x \leq \pi$



10. $y = \sin(\frac{1}{2}x - \frac{\pi}{3})$

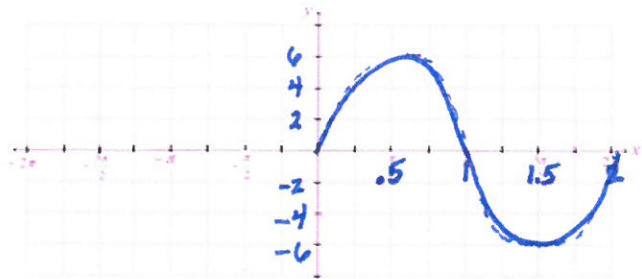
amp: 1; per: $\frac{2\pi}{1/2} = 4\pi$;
 p.s.: $\frac{\pi}{3} = \frac{2\pi}{3}$



$0 \leq \frac{1}{2}x - \frac{\pi}{3} \leq 2\pi$
 $\frac{2\pi}{3} \leq x \leq \frac{14\pi}{3}$

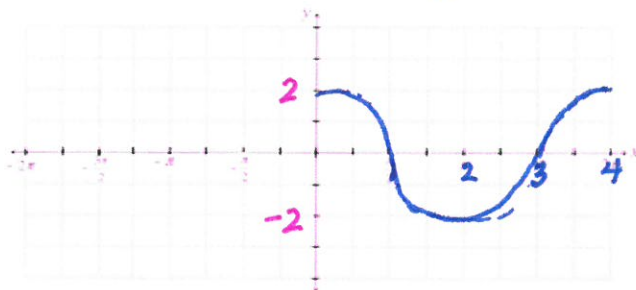
amp: 6; per: $\frac{2\pi}{\pi} = 2$

11. $y = 6 \sin \pi x$



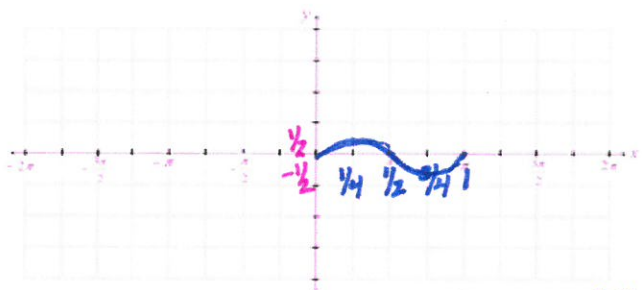
12. $y = 2 \cos \frac{\pi}{2} x$

amp: 2
per: $\frac{2\pi}{\frac{\pi}{2}} = 4$



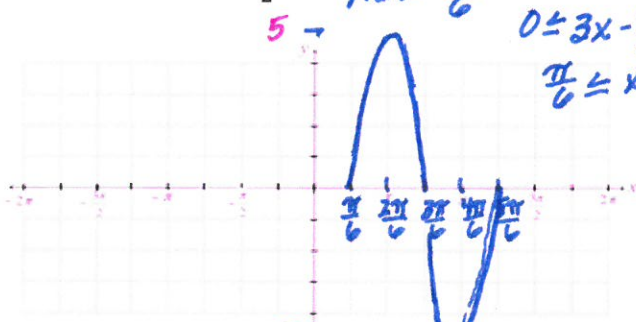
13. $y = \frac{1}{2} \sin 2\pi x$

amp: $\frac{1}{2}$; per: $\frac{2\pi}{2\pi} = 1$



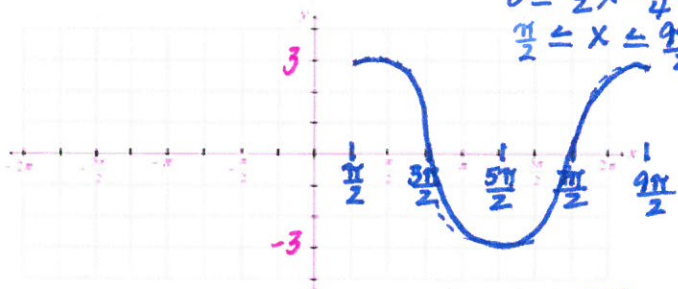
14. $y = 5 \sin (3x - \frac{\pi}{2})$

amp: 5; per: $\frac{2\pi}{3}$
P.S.: $\frac{\pi}{6}$
 $0 \leq 3x - \frac{\pi}{2} \leq 2\pi$
 $\frac{\pi}{6} \leq x \leq \frac{5\pi}{6}$



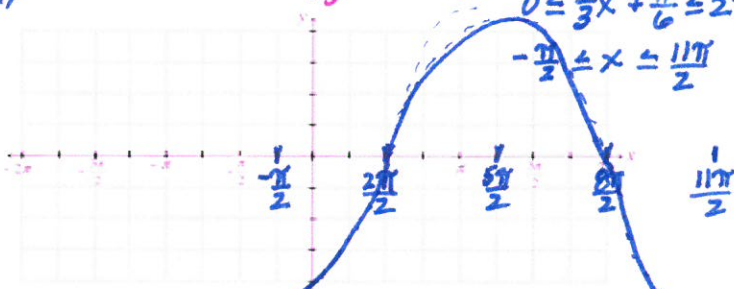
15. $y = 3 \cos (\frac{1}{2}x - \frac{\pi}{4})$

amp: 3; per: $\frac{2\pi}{\frac{1}{2}} = 4\pi$
P.S.: $\frac{\pi}{2}$
 $0 \leq \frac{1}{2}x - \frac{\pi}{4} \leq 2\pi$
 $\frac{\pi}{2} \leq x \leq \frac{9\pi}{2}$



16. $y = -5 \cos (\frac{1}{3}x + \frac{\pi}{6})$

amp: $|-5| = 5$; per: $\frac{2\pi}{\frac{1}{3}} = 6\pi$
P.S.: $-\frac{\pi}{2}$
 $0 \leq \frac{1}{3}x + \frac{\pi}{6} \leq 2\pi$
 $-\frac{\pi}{2} \leq x \leq \frac{11\pi}{2}$



17. $y = 3 \cos (\pi x + 4\pi)$

amp: 3; per: $\frac{2\pi}{\pi} = 2$
P.S.: -4
 $0 \leq \pi x + 4\pi \leq 2\pi$
 $-4 \leq x \leq -2$



18. $y = -\sqrt{2} \sin (\frac{\pi}{2}x - \frac{\pi}{4})$

amp: $|\sqrt{2}| = \sqrt{2}$
per: $\frac{2\pi}{\frac{\pi}{2}} = 4$; P.S.: $\frac{1}{2}$
 $0 \leq \frac{\pi}{2}x - \frac{\pi}{4} \leq 2\pi$
 $\frac{1}{2} \leq x \leq \frac{9}{2}$

