

Pre-Calc Chapter 6 Practice Test

1.

$$250^\circ \cdot \frac{\pi}{180^\circ} = \boxed{\frac{25\pi}{18}}$$

2.

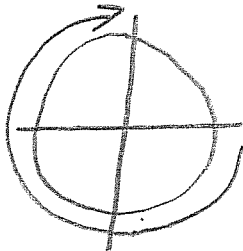
same as #1

3.

$$\frac{7\pi}{15} \cdot \frac{12^\circ}{\pi} = \boxed{84^\circ}$$

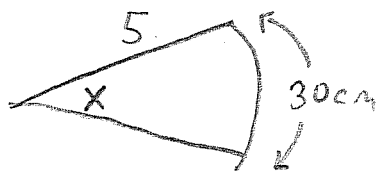
4.

0.75 turns clockwise



$$-270^\circ \text{ or } \boxed{-\frac{3\pi}{2}}$$

5.

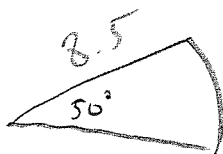


$$\text{Arc length} = \left(\text{Fraction of circle}\right) (\text{Circumference})$$

$$30 = \frac{x}{360} \cdot 2\pi(5)$$

$$\boxed{\frac{1080}{\pi} = x}$$

6.



$$\text{Area sector} = \left(\text{fraction of circle}\right) (\pi r^2)$$

$$= \frac{50}{360} \cdot \pi (3.5)^2$$

$$= 31.525 \text{ cm}^2$$

7.

$$y = A \sin(k\theta + c) + h$$

$$A = 3$$

$$\text{Period} = 3\pi = \frac{2\pi}{k} \Rightarrow k = \frac{2}{3}$$

$$\text{Phase Shift} = 2\pi = \frac{-c}{k}$$

$$2\pi = \frac{-c}{\frac{2}{3}}$$

$$c = -\frac{2}{3}(2\pi) = -\frac{4\pi}{3}$$

$$h = 0$$

$$y = 3 \sin\left(\frac{2}{3}\theta - \frac{4\pi}{3}\right)$$

8.

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

$$A = \frac{1}{3}$$

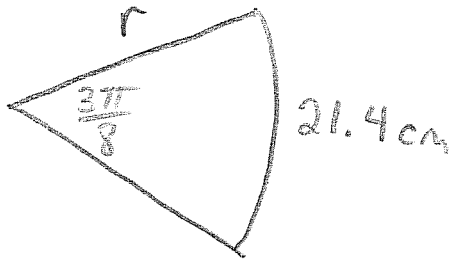
$$\text{Period} = \frac{2\pi}{k} = \frac{2\pi}{2} = \pi$$

$$\text{Phase Shift} = \frac{-c}{k} = \frac{+\pi/3}{2} = \frac{\pi}{6} \text{ right}$$

$$\begin{array}{l} \text{Amp} = \frac{1}{3} \\ \text{Period} = \pi \\ \text{Phase} = \frac{\pi}{6} \text{ right} \end{array}$$

9. skip (never taught)

10.



$$\frac{3\pi}{8} \cdot \frac{1}{2\pi} (2\pi r) = 21.4$$

$$r = \frac{21.4}{\pi} \cdot \frac{8}{3} = 18.165$$

$$D = 2r = 36.330 \text{ cm}$$

11.

$$\begin{aligned} \text{Area of a sector} &= (\text{fraction})(\pi r^2) \\ &= \left(\frac{3\pi}{10} \cdot \frac{1}{2\pi}\right) (\pi (52)^2) \\ &= \boxed{1274.230 \text{ cm}^2} \end{aligned}$$

12.

$$y = A \cos(k\theta + c) + h$$

$$\text{amp} = 4 = A$$

$$\text{period} = 6 = \frac{2\pi}{k} \Rightarrow k = \frac{\pi}{3}$$

$$\text{phase shift} = -\pi = \frac{-c}{k}$$

$$-\pi = \frac{-c}{\frac{\pi}{3}} \quad c = +\frac{\pi^2}{3}$$

$$h = -5$$
$$\boxed{y = 4 \cos\left(\frac{\pi}{3}\theta + \frac{\pi^2}{3}\right) - 5}$$

13. $y = \tan(k\theta + c) + h$

$$\text{Period} = \frac{\pi}{k} = 2\pi \quad k = \frac{1}{2}$$

$$\text{Phase Shift} = \frac{\pi}{4} = -\frac{c}{k}$$

$$\frac{\pi}{4} = -\frac{c}{\frac{1}{2}}$$

$$c = -\frac{\pi}{8}$$

$$y = \tan\left(\frac{\theta}{2} - \frac{\pi}{8}\right) - 1$$

14.

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

$$\text{Amp} = 4$$

$$\text{Period} = \frac{2\pi}{\frac{1}{2}} = 4\pi$$

$$\text{Phase Shift} = -\frac{\frac{\pi}{3}}{\frac{1}{2}} = -\frac{2\pi}{3} = \frac{2\pi}{3} \text{ left}$$

$$\text{Vert shift} = \text{up } 3$$

$$15. \quad y = \cot\left(\frac{x}{4} + \frac{\pi}{2}\right) + 3$$

$$\text{Period} = \frac{\pi}{k} = \frac{\pi}{\frac{1}{4}} = \boxed{4\pi}$$

$$\text{Phase Shift} = -\frac{c}{k} = -\frac{\frac{\pi}{2}}{\frac{1}{4}} = \boxed{-\frac{\pi}{8}}$$

$$\text{Vert shift} = \boxed{3}$$

$$16. \quad y = \arctan(x+3)$$

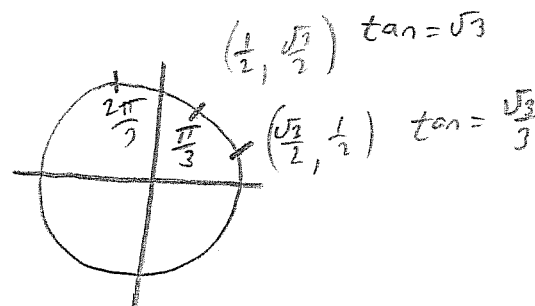
$$x = \arctan(y+3)$$

$$\tan x = y+3$$

$$\boxed{y = \tan(x) - 3}$$

$$17. \quad \sin\left(2 \tan^{-1} \sqrt{3}\right)$$

$$\sin\left(2\left(\frac{\pi}{3}\right)\right) = \boxed{\frac{\sqrt{3}}{2}}$$

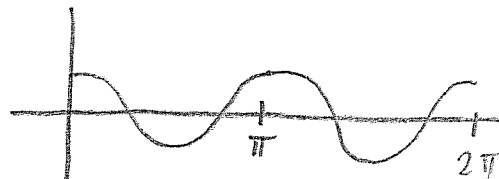


18.

$$y = \cos 2x$$

$$\text{period} = \frac{2\pi}{2} = \pi$$

2 periods in 0 to 2π



19.

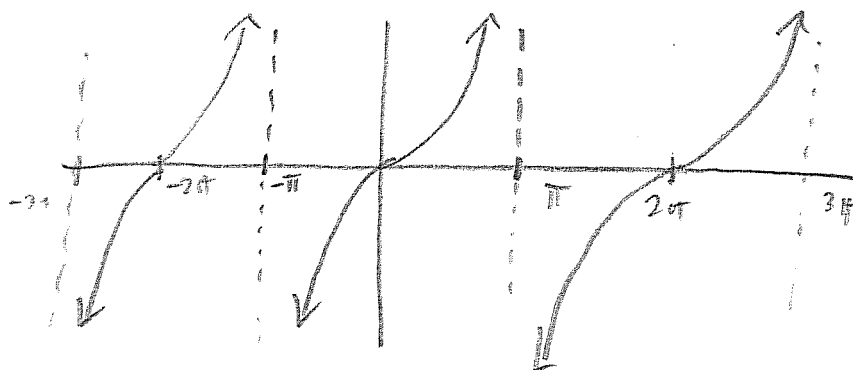
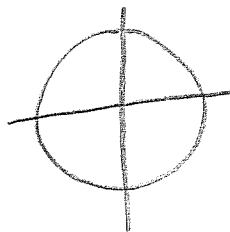
$$y = \tan\left(\frac{x}{2}\right)$$

Find asymptotes first

$$\frac{x}{2} = \frac{\pi}{2} \quad x = \pi$$

or

$$\frac{x}{2} = -\frac{\pi}{2}$$

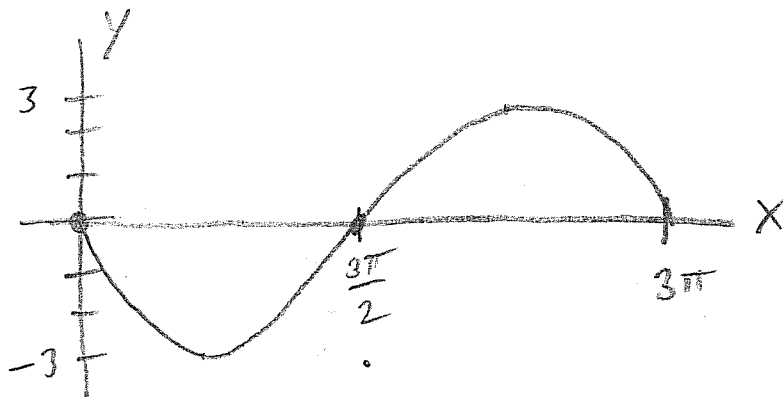


20.

$$y = -3 \sin\left(\frac{2x}{3}\right)$$

$A = 3$ upside down

$$\text{Per} = \frac{2\pi}{\frac{2}{3}} = 2\pi \cdot \frac{3}{2} = 3\pi$$



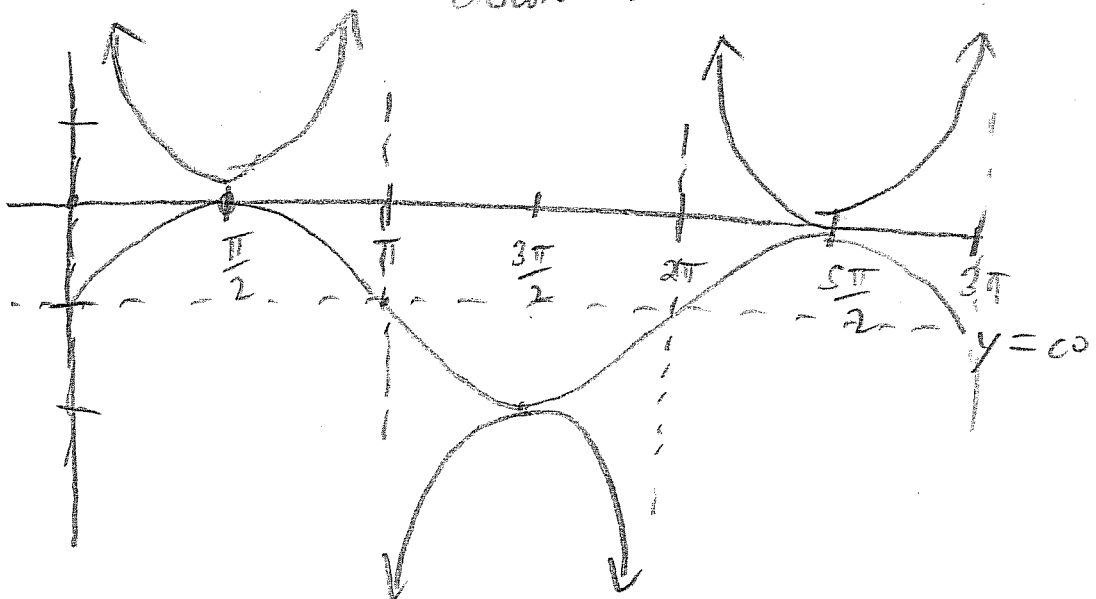
21.

First Graph $y = \cos\left(x - \frac{\pi}{2}\right) - 1$

period = 2π

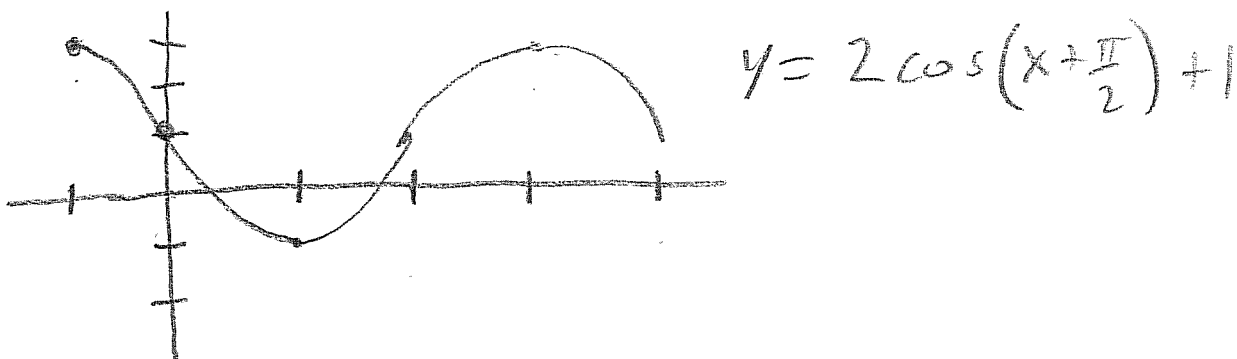
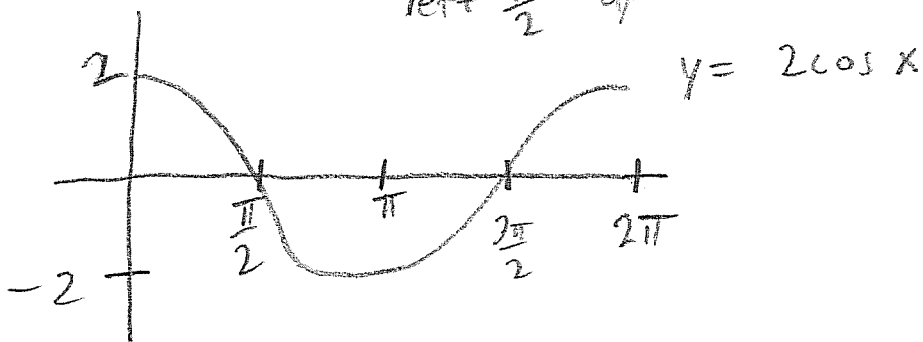
phase shift = $\frac{\pi}{2}$ right

vert shift down 1

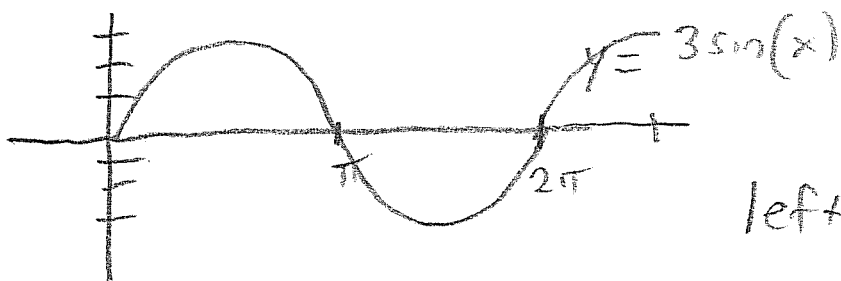


22. $y = 2\cos\left(x + \frac{\pi}{2}\right) + 1$

left $\frac{\pi}{2}$ up 1



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



left $\frac{\pi}{2}$

down 1

