Key

$\sin^{-1}\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

$\cos^{-1}(0, \pi)$

$\tan^{-1}\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

Pre-Calculus Review Day 4

Evaluate without a calculator.

1. $\cos\left(\frac{\pi}{2}\right)$ 0
2. $\sin^{-1}(0.5)$ $\pi/6$
3. $\tan\pi$ $\frac{0}{-1} = 0$
4. $\sec\left(\frac{\pi}{6}\right)$ $\frac{2}{\sqrt{3}}$ or $\frac{2\sqrt{3}}{3}$
5. $\cos^{-1}\left(\frac{-\sqrt{2}}{2}\right)$ $\frac{3\pi}{4}$
6. $\csc\left(\frac{2\pi}{3}\right)$ $\frac{2}{\sqrt{3}}$ or $\frac{2\sqrt{3}}{3}$
7. $\cot 0$ DNE
8. $\tan^{-1}(-1)$ $-\frac{\pi}{4}$
9. $\cos\left(\frac{5\pi}{6}\right)$ $-\frac{\sqrt{3}}{2}$
10. $\sin\left(\frac{11\pi}{6}\right)$ $-\frac{1}{2}$

Without a calculator, sketch the graphs.

11. $y = \sin x$
12. $y = \cos x$
13. $y = \tan x$
14. $y = 1.5\sin(2x)$
15. $y = 2\sin(3x) + 1$
16. $y = -4\sin\left(\frac{\pi}{3}x\right)$
17. $y = \cos(\pi x) - 2$
18. $y = -4\cos\left(\frac{1}{2}\pi x\right)$

Complete the following:

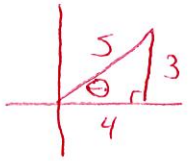
19. $\sin(2x) =$ $2\sin x\cos x$
20. $\tan^2 x + 1 =$ $\sec^2 x$
21. $\cos^2 x =$ $\frac{1+\cos(2x)}{2}$ or $1-\sin^2 x$
22. $\sin^2 x =$ $\frac{1-\cos(2x)}{2}$ or $1-\cos^2 x$
23. $\sin^2 x + \cos^2 x =$ 1
24. $\csc^2 x =$ $1+\cot^2 x$

Solve the equations on the given interval without using a calculator.

25. $\tan x = -1, \quad 0 \le x \le 2\pi$ $\frac{3\pi}{4}, \frac{7\pi}{4}$
26. $\sec x = 2, \quad -\pi \le x \le \pi$ $\cos x = \frac{1}{2}$ $\frac{\pi}{3}, -\frac{\pi}{3}$
27. $4\cos^2 x - 4\cos x + 1 = 0, \ 0 \le x \le 2\pi$ $\pi/3, 5\pi/3$
28. $\sin^2 x - 2\sin x = 0, \quad 0 \le x \le 2\pi$ $0, \pi, \sin^{-1}(2)$

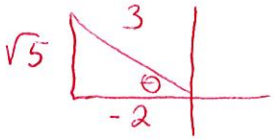
Find the remaining trigonometric ratios.

29. $\sin\theta = \frac{3}{5}, \quad 0 < \theta < \frac{\pi}{2}$



$\cos\theta = 4/5$
$\tan\theta = 3/4$
$\cot\theta = 4/3$
$\sec\theta = 5/4$
$\csc\theta = 5/3$

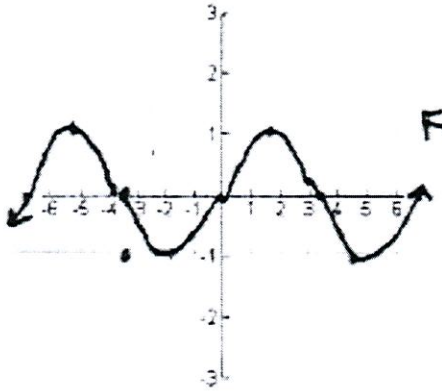
30. $\sec\theta = -1.5, = -\frac{3}{2} \quad \frac{\pi}{2} < \theta < \pi$



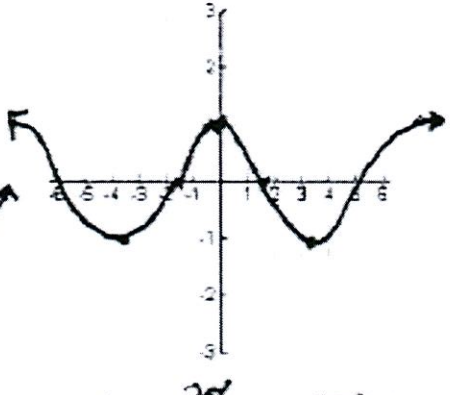
$\cos\theta = -\frac{2}{3}$
$\sin\theta = \frac{\sqrt{5}}{3}$
$\tan\theta = \frac{\sqrt{5}}{-2}$
$\csc\theta = \frac{3}{\sqrt{5}}$
$\cot\theta = -\frac{2}{\sqrt{5}}$

Without a calculator, sketch the graphs:

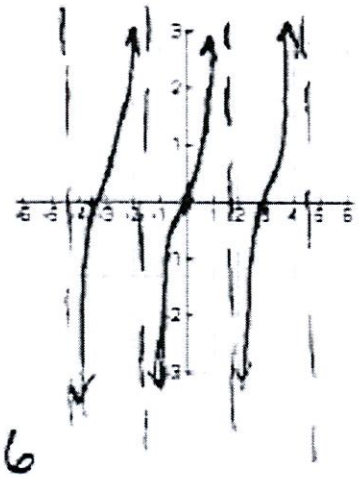
11. $y = \sin x$



12. $y = \cos x$



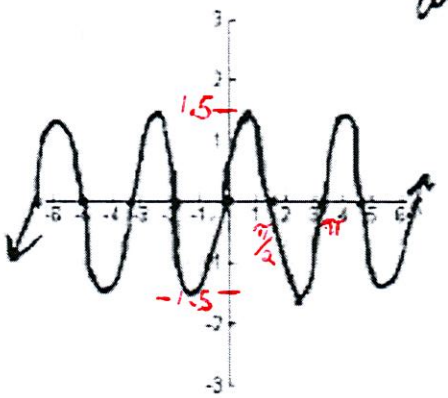
13. $y = \tan x$



14. $y = 1.5\sin(2x)$

$\frac{2\pi}{2} = \pi$ pd:

amp = 1.5

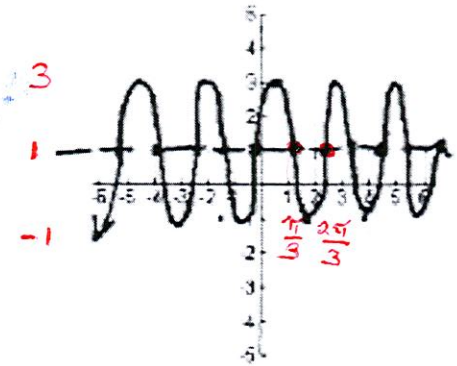


pd = $\frac{2\pi}{\frac{\pi}{3}} = 2\pi \cdot \frac{3}{\pi} = 6$

amp = 2

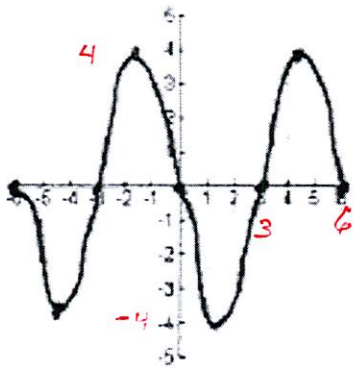
pd = $\frac{2\pi}{3}$

15. $y = 2\sin(3x) + 1$



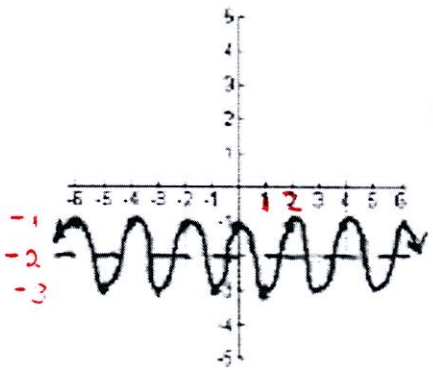
16. $y = -4\sin(\frac{\pi}{3}x)$

stretch



17. $y = \cos(\pi x) - 2$

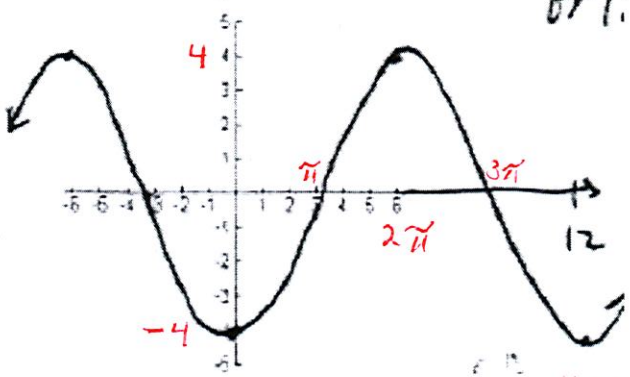
$\frac{2\pi}{\pi} = 2$ down 2



18. $y = -4\cos\left(\frac{1}{2}x\right)$

down first

$\frac{2\pi}{\frac{1}{2}} = 4\pi$ or 1



(27) $4y^2 - 4y + 1 = 0$

$(2y-1)(2y-1) = 0$

$2y - 1 = 0$

$y = 1/2$

$\cos x = 1/2$

$x = \pi/3, 5\pi/3$

(28) $\sin x(\sin x - 2) = 0$

$\sin x = 0 \quad \sin x - 2 = 0$

$x = 0, \pi \quad \sin x = 2$

$x = \sin^{-1}(2)$