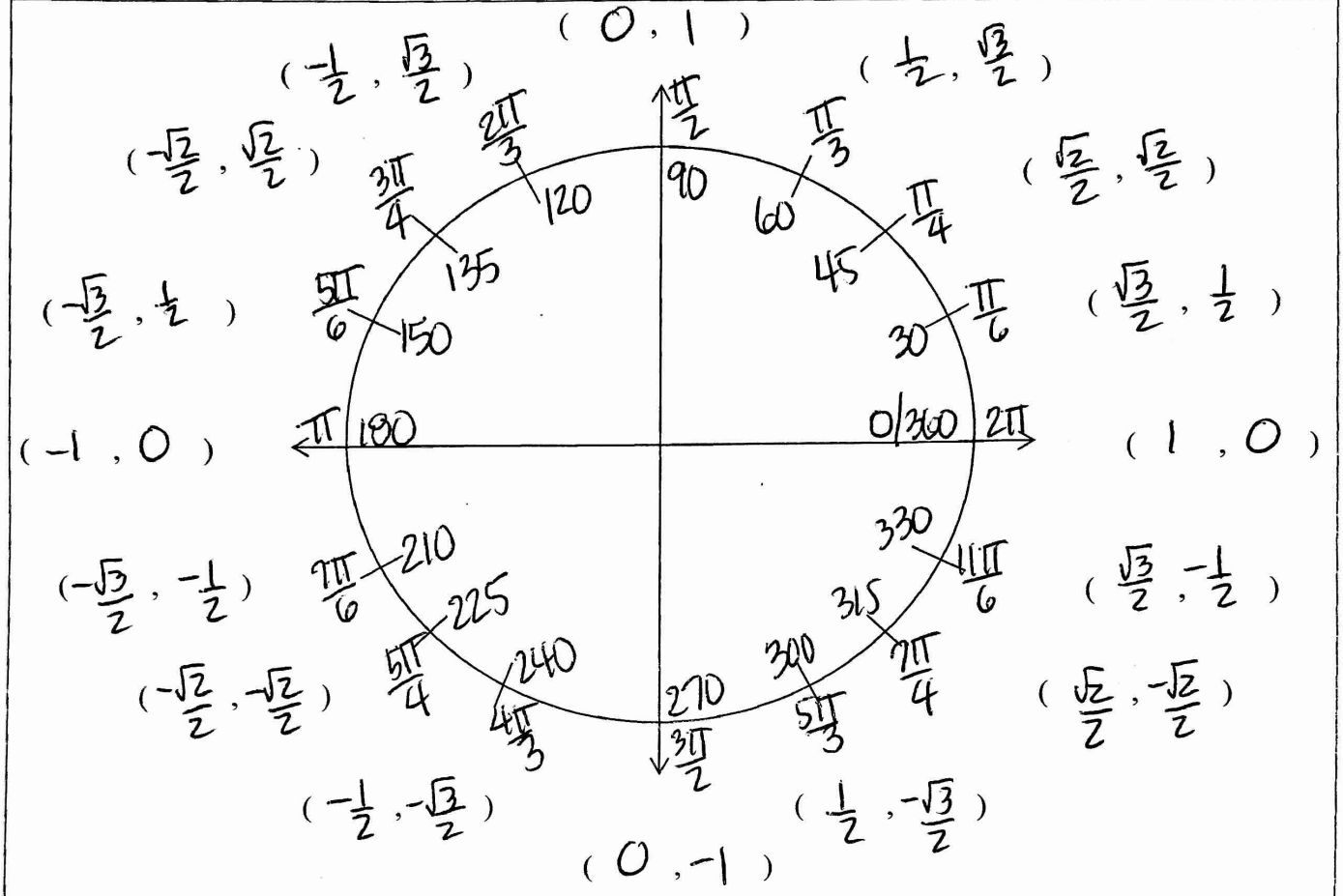
IBMYP A2T Unit 9 Test Review (Targets 4, 5, & 7) Name Master E

YOU MAY NOT USE A CALCULATOR ON ANY PORTION OF THIS! Date _____ Block ____

OBJ: Know the Unit Circle.

Fill in the unit circle below with degrees, radians, and coordinates. Challenge: Fill in tangent values too!

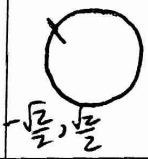


OBJ: Know how to evaluate a function using the unit circle.

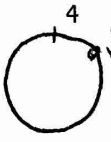
1-21: Evaluate each function below. Show your work and circle your final answer.

1. $\csc 315° = \frac{1}{\sin 315}$ $\frac{-2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$ $\frac{-2\sqrt{2}}{2}$ $(-\sqrt{2})$

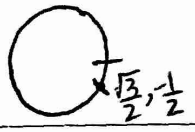
2. $\cos -225°$ $\left(-\frac{\sqrt{2}}{2}\right)$



3. $\tan \frac{9\pi}{4}$ (1)



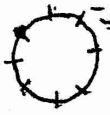
4. $\cot \frac{11\pi}{6}$ $\frac{\sqrt{3}/2}{-1/2} = (-\sqrt{3})$



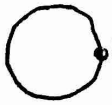
5. $\sec \frac{8\pi}{3} = \frac{1}{\cos \frac{8\pi}{3}} = (-2)$

6. $\sin -\frac{5\pi}{6}$ $\left(-\frac{1}{2}\right)$

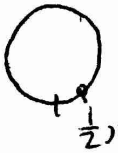
7. $\cot -\frac{13\pi}{4}$ (-1)



8. $\tan -6\pi$ $\frac{0}{1} = (0)$

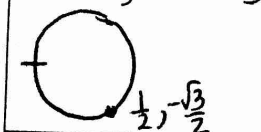


9. $\csc 300° = \frac{1}{\sin 300}$ $\frac{-2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$ $\left(\frac{-2\sqrt{3}}{3}\right)$



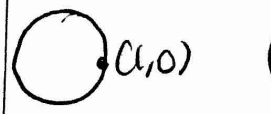
$\frac{6\pi}{3} - \frac{6\pi}{3}$

10. $\sin\frac{17\pi}{3} = \sin\frac{5\pi}{3}$



$-\frac{\sqrt{3}}{2}$

11. $\cos(-720°) + 720 = \cos 0$



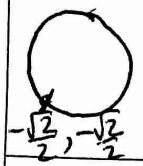
1

12. $\cot\frac{11\pi}{3} - \frac{6\pi}{3} = \frac{5\pi}{3}$

$\frac{1}{2} = \frac{1}{-\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

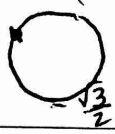
$-\frac{\sqrt{3}}{3}$

13. $\sec 225° = \frac{1}{\cos 225}$



$\frac{-2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{-2\sqrt{2}}{2} = -\sqrt{2}$

14. $\sin\left(-\frac{7\pi}{6}\right)$



$\frac{1}{2}$

15. $\csc\frac{11\pi}{4} - \frac{8\pi}{4} = \csc\frac{3\pi}{4}$

$\frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$

16. $\cos\frac{5\pi}{4}$

$-\frac{\sqrt{2}}{2}$

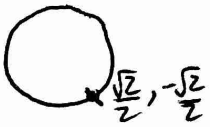
17. $\sec 510° - 360 = \sec 150°$

$= \frac{1}{\cos 150}$

$\frac{-2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

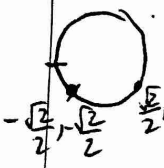
$-\frac{2\sqrt{3}}{3}$

18. $\tan -45°$



-1

19. $\cot\left(\frac{-3\pi}{4}\right)\sec\left(\frac{-\pi}{4}\right)$



$= 1 \cdot \frac{2}{\sqrt{2}} = \frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{2}}{2}$

$\sqrt{2}$

20. $\frac{\tan(-135°)}{\sec 270°} = \frac{1}{\frac{1}{0}}$

0

21. $\frac{4\sin\left(\frac{5\pi}{3}\right) + 2\cos\left(\frac{\pi}{6}\right)}{3\tan\left(\frac{7\pi}{4}\right)}$

$\frac{4\left(-\frac{\sqrt{3}}{2}\right) + 2\left(\frac{\sqrt{3}}{2}\right)}{3(-1)}$

$\frac{-2\sqrt{3} + \sqrt{3}}{-3}$

$\frac{-\sqrt{3}}{-3} = \frac{\sqrt{3}}{3}$

OBJ: Know how to find the inverse of a function using the unit circle or drawing a triangle.

22-33: Find the exact value of each. Show your work and circle your final answer.

22. $\text{Sin}^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

$-60°$

23. $\csc(\text{Arcsin}\frac{\sqrt{3}}{2})$

$\frac{2}{\sqrt{3}}$

$\frac{2\sqrt{3}}{3}$

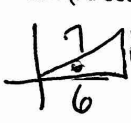
24. $\sin(\text{Tan}^{-1}(-\sqrt{3}))$

$\sin(-60°) = -\frac{\sqrt{3}}{2}$

25. $\text{Sin}^{-1}(1)$

$90°$

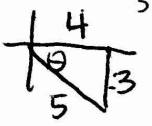
26. $\tan(\text{Arccos}\frac{6}{7})$



$\frac{49}{-36}$
13

$= \frac{\sqrt{13}}{6}$

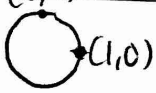
27. $\cot(\text{Sin}^{-1}-\frac{3}{5})$



$\cot = \frac{A}{O}$

$-\frac{4}{3}$

28. $\text{Sin}^{-1}(\cos\frac{\pi}{2})$



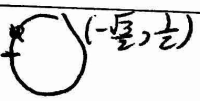
$\text{Sin}^{-1}(0)$

$0°$

29. $\text{Arctan}(-1)$

$-45°$

30. $\text{Cos}^{-1}(\sin\frac{5\pi}{6})$



$\text{Cos}^{-1}(\frac{1}{2})$

$60°$

31. $\text{Arccos}\left[\sin\left(\text{Arcsin}\frac{\sqrt{2}}{2}\right)\right]$

$\text{Arccos}[\sin(45°)]$

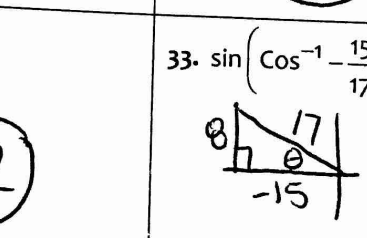
$\text{Arccos}(\frac{\sqrt{2}}{2})$

$45°$

32. $\csc\left(\text{Arcsin}\frac{1}{2}\right)$

2

33. $\sin\left(\text{Cos}^{-1}-\frac{15}{17}\right)$



$\frac{289}{-225}$
64

$\frac{8}{17}$

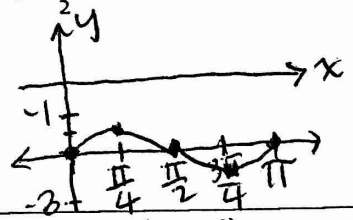
OBJ: Know the range of the inverse functions. 34-36: *State the restricted range of each inverse function.*

34. $y = \text{Cos}^{-1} x$	35. $y = \text{Sin}^{-1} x$	36. $y = \text{Tan}^{-1} x$
$0 \le y \le \pi$ Q1&2	$-\frac{\pi}{2} \le y \le \frac{\pi}{2}$ Q1&4	$-\frac{\pi}{2} < y < \frac{\pi}{2}$ Q1&4

OBJ: Know how to graph trigonometric functions.

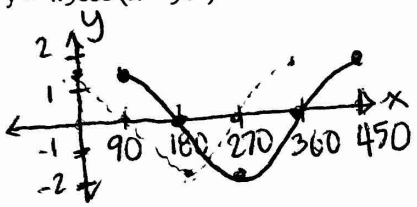
37-42: *Graph each function, labeling all parts and defining each characteristic (if applicable) below.*

37. $y = \frac{1}{2} \sin 2x - 2$



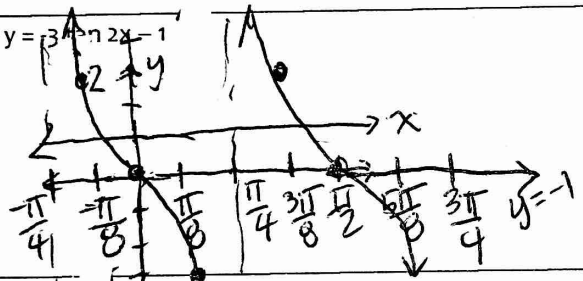
Domain: $(-\infty, \infty)$	Range: $[-2.5, -1.5]$
Period: $\frac{2\pi}{2} = \pi$	Amplitude: $\frac{1}{2}$
Phase Shift: N/A	Vertical Shift (*Midline Eq.*): $y = -2$

38. $y = 1.5\cos(x - 90°)$



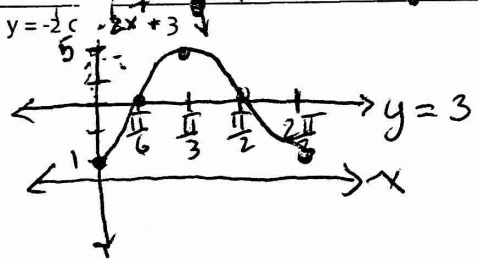
Domain: $(-\infty, \infty)$	Range: $[-1.5, 1.5]$
Period: 2π or 360	Amplitude: 1.5
Phase Shift: $90°$	Vertical Shift (*Midline Eq.*): N/A

39. $y = 3\sin 2x - 1$



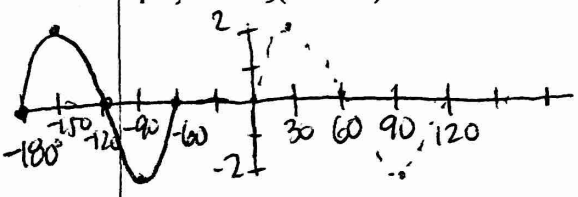
Domain: $\mathbb{R}, x \neq \frac{\pi}{4} + \frac{\pi}{2}n$	Range: $(-\infty, \infty)$
Period: $\frac{\pi}{2}$	Amplitude: N/A
Phase Shift: N/A	Vertical Shift (*Midline Eq.*): $y = -1$

40. $y = -2\cos 3x + 3$



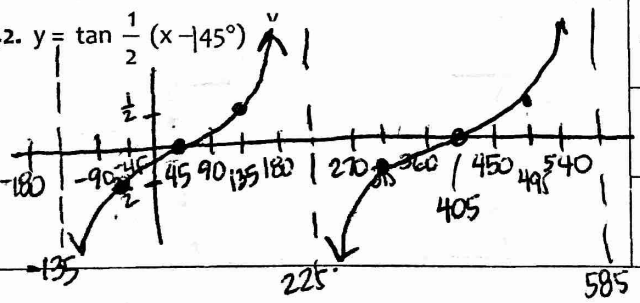
Domain: $(-\infty, \infty)$	Range: $[1, 5]$
Period: $\frac{2\pi}{3}$	Amplitude: 2
Phase Shift: N/A	Vertical Shift (*Midline Eq.*): $y = 3$

41. $y = 2\sin 3(x + 180°)$



Domain: $(-\infty, \infty)$	Range: $[-2, 2]$
Period: $\frac{2\pi}{3}$ or $120°$	Amplitude: 2
Phase Shift: $-180°$	Vertical Shift (*Midline Eq.*): N/A

42. $y = \tan \frac{1}{2}(x - 45°)$



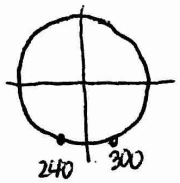
Domain: $\mathbb{R}, x \neq 225 + 360n$	Range: $(-\infty, \infty)$
Period: $\frac{\pi}{\frac{1}{2}} = 2\pi$ or $360°$	Amplitude: N/A
Phase Shift: $45°$	Vertical Shift (*Midline Eq.*): N/A

OBJ: Know how to solve trigonometric equations.

43 – 45: Solve each equation for θ if 0° < θ < 360°. Write your final answers in ascending order.

43. $2\sin\theta = -\sqrt{3}$

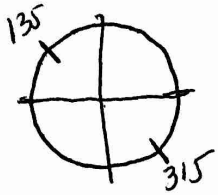
$\sin\theta = -\frac{\sqrt{3}}{2}$



240° & 300°

44. $2\tan\theta = -2$

$\tan\theta = -1$



135° & 315°

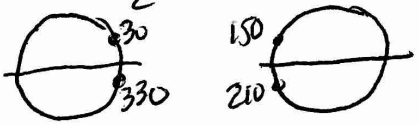
45. $4\cos^2\theta - 3 = 0$

$4\cos^2\theta = 3$

$\sqrt{\cos^2\theta} = \sqrt{\frac{3}{4}}$

$\cos\theta = \pm\frac{\sqrt{3}}{2}$

$\cos\theta = \frac{\sqrt{3}}{2}$ $\quad$ $\cos\theta = \frac{-\sqrt{3}}{2}$



30°, 150°, 210° & 330°

46-48: Solve each equation for θ if 0 < x < 2π. Write your final answers in ascending order.

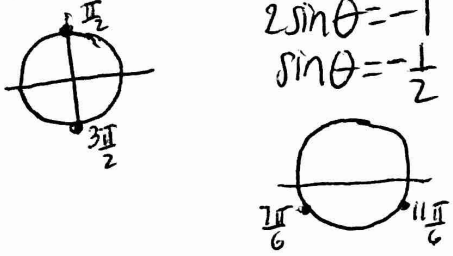
46. $\cos\theta + 2\sin\theta\cos\theta = 0$

$\cos\theta(1 + 2\sin\theta) = 0$

$\cos\theta = 0$ $\quad$ $1 + 2\sin\theta = 0$

$2\sin\theta = -1$

$\sin\theta = -\frac{1}{2}$

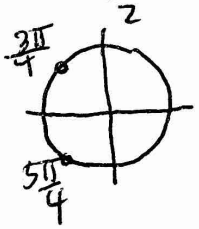


$\frac{\pi}{2}, \frac{7\pi}{6}, \frac{3\pi}{2}, \& \frac{11\pi}{6}$

47. $4\cos\theta - \sqrt{2} = 6\cos\theta$

$-\sqrt{2} = 2\cos\theta$

$-\frac{\sqrt{2}}{2} = \cos\theta$



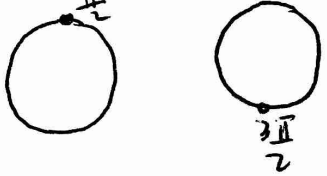
$\frac{3\pi}{4}$ & $\frac{5\pi}{4}$

48. $\sin^2\theta - 1 = 0$

$\sqrt{\sin^2\theta} = \sqrt{1}$

$\sin\theta = \pm 1$

$\sin\theta = 1$ $\quad$ $\sin\theta = -1$



$\frac{\pi}{2}$ & $\frac{3\pi}{2}$

To prepare for the Bonus, Practice proving identities using your golden trig formula sheet!

or $\sin^2\theta - 1 = 0$

$(\sin\theta + 1)(\sin\theta - 1) = 0$

$\sin\theta + 1 = 0$ $\quad$ $\sin\theta - 1 = 0$

$\sin\theta = -1$ $\quad$ $\sin\theta = 1$