Precalculus Test Sections 4.7 and 4.8 Name _____

I. Multiple Choice

_____ 1. $ArcCos\left(-\frac{1}{2}\right) =$

(A) -60˚ (B) -30˚ (C) 60˚ (D) 120˚ (E) 240˚

_____ 2. $Tan^{-1}\left(\sqrt{3}\right) =$

(A) -30˚ (B) -60˚ (C) 30˚ (D) 60˚ (E) None of these

_____ 3. What is the range of y = ArcSin (x) ?

(A) $0° \le y \le 180°$ (B) $-90° \le y \le 90°$ (C) 0˚ < y < 360˚

(D) $-1 \le y \le 1$ (E) $-\infty \le y \le \infty$

_____ 4. Let Let $y = \left|\sin(x) - ½\right|$. The maximum value attained by y is:

(A) $\frac{1}{2}$ (B) 1 (C) $\frac{3}{2}$ (D) $\frac{\pi}{2}$ (E) $\frac{3\pi}{2}$

_____ 5. $Arc\tan\left(\tan\left(\frac{\pi}{6}\right)\right) =$

(A) $\sqrt{3}$ (B) $\frac{\sqrt{3}}{3}$ (C) $\frac{\sqrt{3}}{2}$ (D) $-\frac{\pi}{6}$ (E) $\frac{\pi}{6}$

_____ 6. Let y = cos (Arctan x). What is the range of y?

(A) $0 < y \le 1$ (B) $0 \le y \le 1$ (C) $-1 \le y \le 1$

(D) $-1 < y < 1$ (E) $-\frac{\pi}{2} < y < \frac{\pi}{2}$

_____ 7. Evaluate $\sec\left(Sin^{-1}\left(\frac{15}{17}\right)\right) =$

(A) $\frac{8}{17}$ (B) $-\frac{8}{17}$ (C) $\frac{15}{8}$ (D) $\frac{17}{8}$ (E) None of these

_____ 8. A boat is d feet from a dock (horizontal distance). The dock is 50 feet above sea level. The angle of depression from the dock to the boat is θ. Write θ as a function of d.

(A) $\theta = \frac{Tan^{-1}(d)}{50}$ (B) $\theta = Sin^{-1}\left(\frac{d}{50}\right)$ (C) $\theta = Tan^{-1}\left(\frac{50}{d}\right)$

(D) $\theta = 50\,Tan^{-1}(d)$ (E) None of these

_____ 9. The angle of elevation of the sun is 30˚. Find the length of a shadow cast by a person 6 feet tall.
(A) 10.4 feet (B) 9.6 feet (C) 8 feet (D) 7.9 feet (E) None of these

II. Graph the following on ***your own paper.***

10. On the same set of axes, using the same scales on each axis, draw graphs of $y = \cos(x)$ and $y = \text{Cos}^{-1}x$.

11. Graph $y = \text{ArcCsc } x$

III. Free Response. Show ***all work on your own paper.***

12. If you build a skateboard ramp at a 34˚ angle of elevation, and its horizontal distance is 14 feet, how high will the highest point of the ramp be?

13. A ship is 90 miles south and 40 miles west of port. If the captain wants to travel directly to port, what bearing should be taken?

14. An official at The Winchester Amusement Park has determined that the best angle for a slide was 54˚ (with the ground). If he has 50 feet of space that he could use for the base of the slide, how long should the slide be?

15. The pilot of an airplane flying at an elevation of 4000 feet sights two trees that are 300 feet apart. If the angle of depression to the base of the tree closer to him is 36˚, determine the angle of the depression to the second tree.

16. Given $\triangle ABC$ with $m\angle C = 90°$, AB = 16 inches, and BC = 6.3 inches. Determine $m\angle A$, $m\angle B$, and the length of $\overline{AC}$.

Extra Credit. 17. Express the ArcCsc (x) in terms of the ArcTangent.