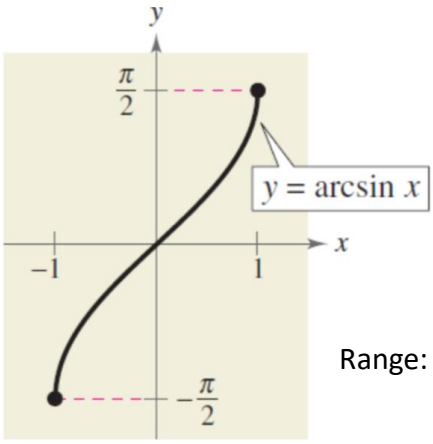
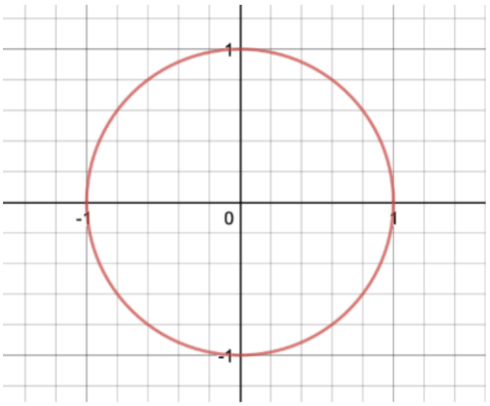
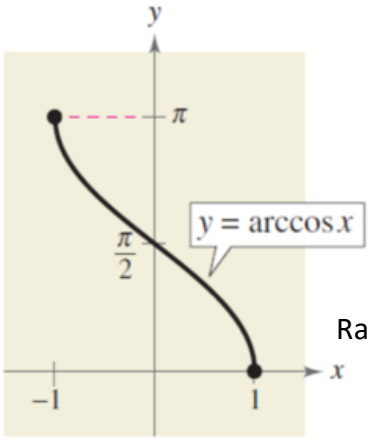
Inverse Trigonometry – Study Guide

Draw and notate the range of each inverse function on the unit circle graph to the right; also write the range in the space provided:



Range: _____





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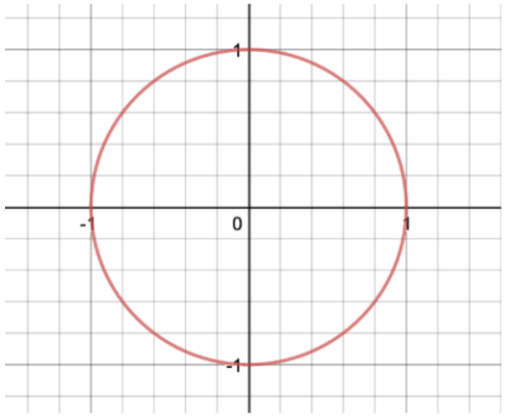
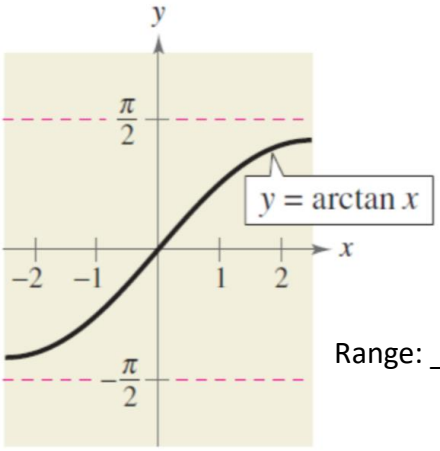
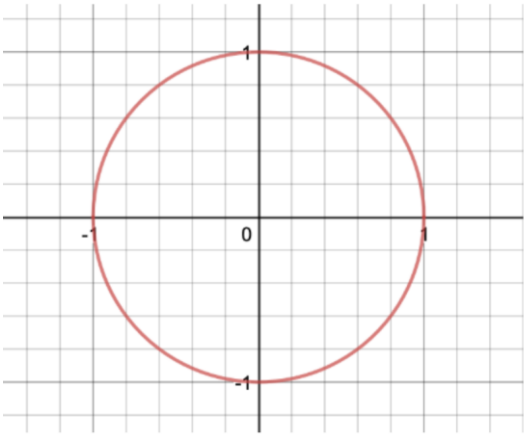




Range: _____



PART 1 – Solving inverse trig expressions.

Solve each expression; be sure your answer is within the correct range of each function.

1) $\sin^{-1} 0$

2) $\tan^{-1} 1$

3) $\tan^{-1} 0$

4) $\sin^{-1} \frac{\sqrt{2}}{2}$

5) $\tan^{-1} \frac{\sqrt{3}}{3}$

6) $\sin^{-1} \frac{\sqrt{3}}{2}$

7) $\cos^{-1} 0$

8) $\cos^{-1} -\frac{1}{2}$

9) $\sin^{-1} \frac{1}{2}$

10) $\cos^{-1} \frac{\sqrt{2}}{2}$

11) $\cos^{-1} -\frac{\sqrt{2}}{2}$

12) $\cos^{-1} 1$

13) $\sin^{-1} -\frac{1}{2}$

14) $\cos^{-1} \frac{1}{2}$

15) $\cos^{-1} \frac{\sqrt{3}}{2}$

16) $\cos^{-1} -1$

17) $\tan^{-1} -\frac{\sqrt{3}}{3}$

18) $\sin^{-1} -1$

19) $\tan^{-1} -1$

20) $\sin^{-1} 1$

PART 2 – Solving compound trig expressions.

Solve each expression; draw a triangle as needed, and make sure answers are in the correct range. Some may be undefined.

21) $\tan \sin^{-1} \frac{4}{5}$

22) $\tan \cos^{-1} \frac{\sqrt{2}}{2}$

23) $\tan \sin^{-1} \frac{1}{2}$

24) $\sec \tan^{-1} \frac{4}{3}$

25) $\cos \sin^{-1} \frac{\sqrt{11}}{6}$

26) $\tan \tan^{-1} \frac{\sqrt{2}}{4}$

27) $\arcsin\left(\sin \frac{3\pi}{2}\right) =$

28) $\cot \cos^{-1} \frac{5}{13}$

29) $\csc \cos^{-1} \frac{5}{13}$

30) $\arctan(sin1) =$

PART 3 – Algebraic solutions to compound expressions.

Solve each compound expression in terms of x.

31) $\sec \sin^{-1} x$

32) $\tan \cos^{-1} x$

33) $\csc \sin^{-1} x$

34) $\sin \cos^{-1} x$

35) $\cot \sin^{-1} x$

36) $\cot \cos^{-1} x$

37) $\sin\left(\arctan\frac{1}{x}\right) =$

38) $\tan(\cos^{-1} 2x^2) =$

39) $\cot\left(\sin^{-1}\frac{a}{b}\right) =$

40) $\csc\left(\cos^{-1}\frac{x}{\sqrt{2}}\right) =$