

Extra Practice: Trigonometry

1. Evaluate the following (exactly, without a calculator):

(a) $\sin(3\pi/4)$

(c) $\tan(2\pi/3)$

(e) $\csc(29\pi/6)$

(b) $\cos(-5\pi/4)$

(d) $\sec(7\pi/6)$

(f) $\tan(\pi/4)$

2. What is the amplitude, period and frequency for $f(x) = 1 + 2\cos(3x)$

3. What is the period of $f(x) = \tan(\pi/x)$? $f(x) = \cos(x/\pi)$?

4. Solve for x :

(a) $2\cos(x) + 1 = 0$

(b) $3\cot^2(x) = 1$

(c) $\sin(x) > \cos(x)$

5. Review the definition of the inverse trigonometric functions, then compute the following, if possible:

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

(d) $\sin^{-1}(2)$

(g) $\tan^{-1}(1)$

(b) $\sin^{-1}(1)$

(e) $\tan^{-1}(-\sqrt{3})$

(h) $\sec^{-1}(-2)$

(c) $\arcsin(1/2)$

(f) $\tan^{-1}(0) = 0$

(i) $\sec^{-1}(2/\sqrt{3})$

6. Inverse trig identities: Simplify each expression.

(a) $\sin^{-1}(\sin(\pi))$

(c) $\tan^{-1}(\tan(\pi/4))$

(b) $\sin(\sin^{-1}(3/5))$

(d) $\tan^{-1}(\tan(\pi))$

7. Simplify the following expressions (using a triangle). Also think about the value(s) of x for which the simplification is valid.

(a) $\tan(\sin^{-1}(x))$

(d) $\tan(\sec^{-1}(x))$

(b) $\cos(\tan^{-1}(x))$

(e) (*) $\cos(2\sin^{-1}(x))$

(c) $\sec(\sin^{-1}(x))$

(f) (**) $\sin(2\tan^{-1}(x))$

Hints: (*) Use $\cos(2x) = \cos^2 x - \sin^2 x$, (**) Use $\sin(2x) = 2\sin(x)\cos(x)$