

Math 1500 Fall 2010
Optional Trig Problems

1. Graph the functions below by hand, not by plotting points, but by starting with the graph of one of the standard functions and then applying the appropriate transformation.

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

(b) $y = 4 \sin 3x$

(c) $y = \frac{1}{4} \tan \left(x - \frac{\pi}{4} \right)$

2. Find the functions (a) $f \circ g$, (b) $g \circ f$, (c) $f \circ f$, (d) $g \circ g$ and their domains.

(i) $f(x) = 1 - 3x$, $g(x) = \cos x$

(ii) $f(x) = \frac{x}{1+x}$, $g(x) = \sin 2x$

3. Express $f(x) = \sin(\sqrt{x})$ in the form $h \circ g$.

4. Find the domain of $g(t) = \sin(e^{-t})$.

5. Find the exact value of each expression without using a calculator.

(a) $\sin^{-1}(\sqrt{3}/2)$

(b) $\arctan 1$

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

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

6. Simplify the expressions below.

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

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

7. Determine the infinite limits.

(a) $\lim_{x \rightarrow 2\pi^-} x \csc x$

(b) $\lim_{x \rightarrow \pi^-} x \cot x$