

## MATH 141 WORKSHEET 1

Show all work for full credit.

1. Find the domain.

$$f(x) = \sqrt{x+7} - \sqrt{x^2-9}$$

2. Find  $\left(\frac{f}{g}\right)(x)$  and its domain.

$$f(x) = \sqrt{4-x^2}$$

$$g(x) = \frac{1}{\sqrt{x}}$$

3. Find  $(f \circ g)(x)$  and its domain.

$$f(x) = \sqrt{3-x^2}$$

$$g(x) = \sqrt{x-2}$$

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4. Express the following functions as the composition of *three* functions. That is, find functions  $f$ ,  $g$ , and  $h$  such that  $F(x) = f(g(h(x)))$ .

NOTE: **You may not choose  $y = x$  as one of your functions.**

a.  $F(x) = \sqrt{1 + \sin^3(x)}$

b.  $F(x) = \ln(\cos^5 x)$

5. Evaluate each of the following exactly. Remember to give your answer in radians.

a.  $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

b.  $\tan^{-1}(1)$

c.  $\sin^{-1}\left(-\frac{1}{2}\right)$

d.  $\cos^{-1}(-1)$

e.  $\sin^{-1}\left(\frac{1}{\sqrt{2}}\right)$

6. Determine whether the following functions are even, odd, or neither. You must explain your answers.

a.  $f(x) = \frac{x^2+1}{x^4-2}$

b.  $f(x) = \frac{2x+1}{x-1}$

7. Find  $f(f(x))$  and simplify.

$$f(x) = \frac{2x+1}{x+3}$$