

# Math 12 Practice Final, Winter Quarter 2004

**Problem 1** Find the domain:

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

Find the range:

- $f(x) = 3x + 2$
- $f(x) = (3x + 2)^2 + 1$
- $f(x) = \cos x$
- $f(x) = \frac{4-x}{3x+2}$

**Problem 2** What is the average rate of change of  $y = \sqrt{x}$  on the interval  $[1,4]$ ?

What is the average rate of change of  $y = 2^x$  on the interval  $[1,4]$ ?

What is the average rate of change of  $y = \sqrt{x} + 2^x$  on the interval  $[1,4]$ ?

**Problem 3** Rational function

**Problem 4** Solve:

- $t^2 + 3t - 4 = 0$
- $3 \cos A - \sin^2 A = 3$
- $5^{4x} + 3(5^{2x}) - 4 = 0$

**Problem 5** Write as a combination of several logarithms, with no exponents:

$$\log_3 \left( \frac{\sqrt{(x-4)^3(x^4)}}{9(x+2)(x+1)^5} \right)$$

**Problem 6** Find  $\sin 13\pi/6$ ,  $\cos(-3\pi/4)$ .

**Problem 7** Given that  $\pi < \theta < 3\pi/2$  and  $\tan \theta = 1/4$ , find  $\sin(2\theta)$ .

**Problem 8** Find  $\cos 15^\circ$ .