

## Placement Quiz

*Calculators and notes are not allowed. You have 20 minutes to complete the test.*

*There are 6 questions worth a total of 20 points.*

**Problem 1.** (*parts are 1 point each*) Simplify the following expressions. In some cases there may be no correct simplification, in which case leave the expression in its original form.

(1)  $\cos(5\pi/6)$

(2) 
$$\frac{x\sqrt{x} + x^{-1}}{x^3}$$

(3) 
$$\frac{(4a^3)^{1/2}}{4}$$

(4)  $\log_{10}\left(\frac{1}{10}\right)$

**Problem 2.** (*parts are 2 points each*) Solve for  $x$ .

(1)  $\sin(x) = 0$

(2)  $2x^2 - x = 1$

**Problem 3.** (*3 points*) Let  $f(x) = 5 - 4x$ . Compute and simplify

$$\frac{f(a) - f(a - h)}{h}.$$

**Problem 4.** (2 points) Write the expression

$$\frac{x}{x^2 - 1} - \frac{2}{x + 1}$$

in the form  $\frac{p(x)}{q(x)}$  where  $p(x)$  and  $q(x)$  are polynomials. Make the expression as simple as possible.

**Problem 5.** (3 points) Give a formula for the equation of a line passing through  $(2, -3)$  and parallel to the line  $x - 3y = 6$ .

**Problem 6.** (3 points) Sketch the graph of  $y = -2 \cos(x)$ .