

Placement Quiz: SOLUTIONS

1. (a) $\cos(5\pi/6) = -\sqrt{3}/2$

(b)

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

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

(d) $\log_{10}(\frac{1}{10}) = -1$

2. (a) $x = \dots, -2\pi, -\pi, 0, \pi, 2\pi, \dots$

(b) $2x^2 - x = 1$ is equivalent to $2x^2 - x - 1 = 0$. Now factor to get: $(2x+1)(x-1) = 0$.

Thus, $x = 1$ or $x = -1/2$.

3. (3 points) Note $f(a) - f(a-h) = 5 - 4a - [5 - 4(a-h)] = -4h$. Thus,

$$\frac{f(a) - f(a-h)}{h} = \frac{-4h}{h} = -4.$$

4.

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

5. (3 points) The line $x - 3y = 6$ has slope $m = 1/3$. So our line must have the form $y + 3 = (1/3)(x - 2)$ or $y = (1/3)x - (11/3)$.

6. We have graphed $y = -2\cos(x)$ in class. In short, this function looks like $\cos(x)$ but the minus sign causes a reflection of the graph across the x axis. The "2" stretches the graph vertically by a factor of two.