Professor Katiraie Math 103 Quiz Eight Form A Fall 2006 (20 Pts)

Name Solution

1) Find the inverse of the following functions (2.5 points each)

a) $f(x)=2x-5$

Step I) $y=2x-5$

Step II) Solve for x $\quad 2x=y+5$

$x=\frac{y+5}{2}$

Step III) $f^{-1}(x)=\frac{x+5}{2}$

b) $g(x)=4x$

$y=4x$

$4x=y$

$x=\frac{y}{4}$

$g^{-1}(x)=\frac{x}{4}$

2) Solve $2x^2+4x=7$ by completing square method. (3 points)

$2(x^2+2x\quad)=7$

$2(x^2+2x+1)=7+2$

$x^2+2x+1=\frac{9}{2}$

$(x+1)^2=\frac{9}{2}$

$x+1=\pm\sqrt{\frac{9}{2}}$

$x+1=\pm\frac{3}{\sqrt{2}}$

$x=-1\pm\frac{3}{\sqrt{2}}$

$x=-1\pm\frac{3\sqrt{2}}{2}$ OR $\frac{-2\pm3\sqrt{2}}{2}$

3) Solve $x(-3x+4)=2$, using the quadratic formula. (3 points)

$-3x^2+4x-2=0 \quad a=-3 \quad b=4 \quad c=-2$

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$x=\frac{-4\pm\sqrt{16-4(-3)(-2)}}{2(-3)}=\frac{-4\pm\sqrt{16-24}}{-6}$

$=\frac{-4\pm\sqrt{-8}}{-6}=\frac{-4\pm2\sqrt{2}i}{6}=\frac{2}{3}\pm\frac{\sqrt{2}i}{3}$

4) Solve $2x^2 = x + 4$, using the quadratic formula. (3 points)

$2x^2 - x - 4 = 0 \quad a = 2 \quad b = -1 \quad c = -4$

$x = \frac{1 \pm \sqrt{(-1)^2 - 4(2)(-4)}}{2(2)} = \frac{1 \pm \sqrt{1 + 32}}{4} = \frac{1 \pm \sqrt{33}}{4}$

5) Write $y = x^2 + 4x + 1$ in vertex form. Identify the vertex. (3 points)

$y = x^2 + 4x + 1$

$= x^2 + 4x + 4 + 1 - 4$

$y = (x+2)^2 - 3$

Vertex $= (-2, -3)$

6) Find the vertex and the axis of symmetry for the graph of

(3 points)

$f(x) = -\frac{1}{2}x^2 + 2x - 5$

$x = \frac{-b}{2a} = \frac{-2}{2(-\frac{1}{2})} = \frac{-2}{-1} = 2$

$y = -\frac{1}{2}(2)^2 + 2(2) - 5 = -3$

Vertex $= (2, -3)$

$x = 2$ axis of symmetry