QUIZ 4 - 943-DW
FALL 2011
SOLUTIONS

1- Solve the following equations by any technique.

(a) $x^2+7x-60=0$

Solution.

$(x-5)(x+12)=0$

$\boxed{x=5 \ \& \ x=-12}$

(b) $3x^2=-2x-12$

Solution.

$3x^2+2x+12=0$

$x=\frac{-2\pm\sqrt{4-4(3)(12)}}{2(3)}=\frac{-2\pm\sqrt{-140}}{6}$ $\boxed{\text{NO SOLUTIONS}}$

(c) $2x^2+x=3$

Solution.

$2x^2+x-3=0$

$2x^2+2x-3x-3=0$

$2x(x+1)-3(x+1)=0$

$(x+1)(2x-3)=0$

$\boxed{x=-1 \quad x=3/2}$

2- Factor the following difference of squares

$8x^3-27$

Solution.

$\boxed{8x^3-27=(2x-3)(4x^2+6x+9)}$

3- Graph the following; indicating all intercepts & the vertex:

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

SOLUTION.

y-intercept

$x = 0 \quad y = 2$

x-intercepts

$y = 0 \qquad 0 = -x^2 + x + 2$

$x^2 - x - 2 = 0$

$(x-2)(x+1) = 0$

$x = 2 \;\&\; x = -1$

INTERCEPTS

$(2,0) \quad (-1,0)$

VERTEX

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

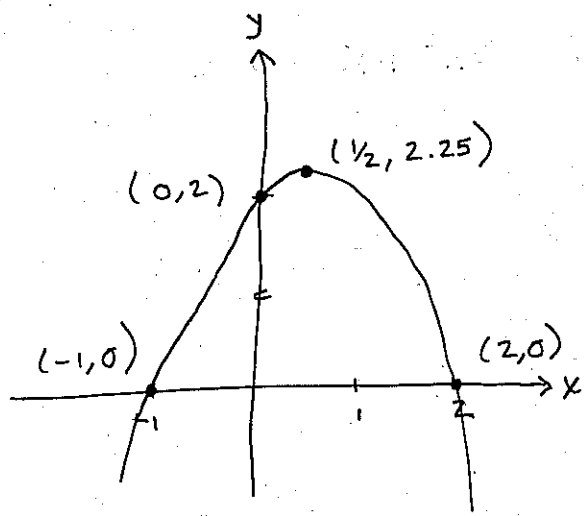
$y = -\left(\frac{1}{2}\right)^2 + \frac{1}{2} + 2$

$= -\frac{1}{4} + \frac{1}{2} + 2$

$= -\frac{1}{4} + \frac{2}{4} + \frac{8}{4}$

$= \frac{9}{4} = 2.25$

$(0.5, 2.25)$



(b) Find domain & range of $y = f(x)$

DOMAIN : $\mathbb{R}$

RANGE : $(-\infty, 2.25]$