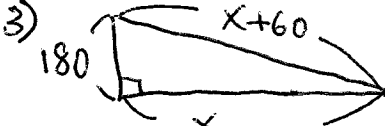


Ch 11

1) $x^2 + 4x + 8 = 0$
 $x^2 + 4x = -8 \Rightarrow x^2 + 4x + 4 = -8 + 4$
 $x^2 + 4x + 4 = -4 \Rightarrow (x+2)^2 = -4$
 $x+2 = \pm\sqrt{-4} = \pm 2i$
 $x = -2 \pm 2i$

2) $3x^2 - 1 = -6x \Rightarrow 3x^2 + 6x = 1$
 $\Rightarrow 3(x^2 + 2x + 1) = 1 + 3 = 4$
 $3(x+1)^2 = 4 \Rightarrow (x+1)^2 = \frac{4}{3}$
 $x+1 = \pm \frac{2}{\sqrt{3}} = \pm \frac{2\sqrt{3}}{3}$
 $x = -1 \pm \frac{2\sqrt{3}}{3} = \frac{-3 \pm 2\sqrt{3}}{3}$

3) 
 ~~$x^2 + 180^2 = (x+60)^2$~~
 $x^2 + 32400 = x^2 + 120x + 3600$
 $120x = 32400 - 3600 = 28800$
 $x = 28800 / 120 = 240$

4) $x^2 - 6x + 13 = 0$
 $a=1, b=-6, c=13$
 $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $= \frac{6 \pm \sqrt{36 - 4(1)(13)}}{2} = \frac{6 \pm \sqrt{-16}}{2}$
 $= \frac{6 \pm 4i}{2} = 3 \pm 2i$

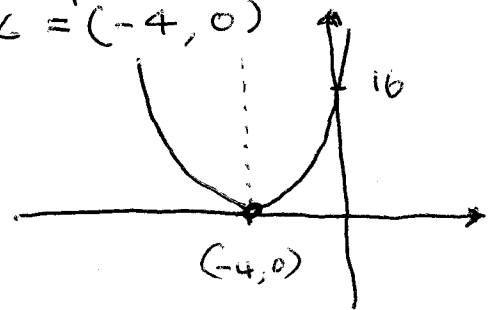
5) $2(x+2) + 3(x-2) = 2(x^2 - 4)$
 $6x = 2x^2 - 8 \Rightarrow 2x^2 - 6x - 8 = 0$
 $x^2 - 3x - 4 = 0 \Rightarrow (x-4)(x+1) = 0$
 $x = 4 \text{ or } x = -1$

6) $x^{2/3} + 3x^{1/3} - 4 = 0$
 let $y = x^{1/3}$, then $y^2 + 3y - 4 = 0$
 $(y+4)(y-1) = 0 \Rightarrow y = -4 \text{ or } y = 1$
 $\Rightarrow x^{1/3} = -4 \text{ or } x^{1/3} = 1$
 $\Rightarrow x = (-4)^3 = -64 \text{ or } x = 1^3 = 1$

7) $x^4 - 14x^2 + 45 = 0$
 let $y = x^2$, then $y^2 - 14y + 45 = 0$
 $(y-9)(y-5) = 0 \Rightarrow y = 9 \text{ or } y = 5$
 $\Rightarrow x^2 = 9 \text{ or } x^2 = 5$
 $\Rightarrow x = \pm 3 \text{ or } x = \pm\sqrt{5}$

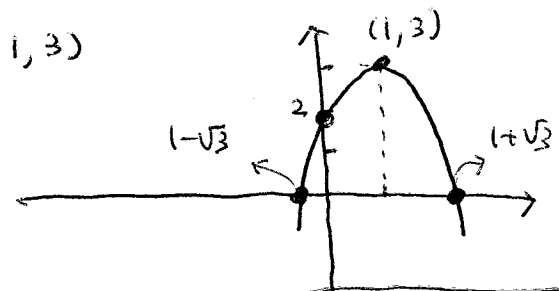
8) $f(x) = x^2 + 8x + 16 = (x+4)^2$

y-intercept = 16
 x-intercept = -4
 vertex = (-4, 0)



9) $g(x) = -x^2 + 2x + 2 = -(x^2 - 2x + 1) + 2 + 1$
 $= -(x-1)^2 + 3$
 y-intercept = 2
 $x\text{-intercept} = \frac{-2 \pm \sqrt{4 + 8}}{-2} = \frac{-2 \pm 2\sqrt{3}}{-2} = 1 \pm \sqrt{3}$

vertex = (1, 3)



10) $\frac{4y+5}{y-2} \leq 0$

| | $4y+5$ | $y-2$ | $\frac{4y+5}{y-2}$ |
|----------------|--------|-------|--------------------|
| $y \leq -5/4$ | - | - | + |
| $-5/4 < y < 2$ | + | - | - |
| $y > 2$ | + | + | + |

The solution

$-\frac{5}{4} < y < 2$

$[-\frac{5}{4}, 2)$