10. $\sqrt{\frac{53}{3}}\frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{159}}{3}\frac{\sqrt{53}}{\sqrt{3}}$

1

8. $\frac{2x^2}{2} + \frac{6x}{2} - \frac{5}{2} = \frac{0}{2}$

$x^2 + 3x - \frac{5}{2} = 0$

$+\frac{5}{2} \quad +\frac{5}{2}$

$x^2 + 3x + \frac{9}{4} = \frac{5}{2} + \frac{9}{4}$

$3 \div 2 = \left(\frac{3}{2}\right)^2 = \frac{9}{4}$

$\sqrt{\left(x + \frac{3}{2}\right)^2} = \sqrt{\frac{19}{4}}$

$x + \frac{3}{2} = \pm\frac{\sqrt{19}}{2}$

$-\frac{3}{2} \quad -\frac{3}{2}$

$x = -\frac{3}{2} \pm \frac{\sqrt{19}}{2}$

5. $x^2 = 7x$

$-7x \quad -7x$

$x^2 - 7x = 0$

$x(x-7) = 0$

$x = 0 \quad x - 7 = 0$

$+7 \quad +7$

$x = 7$

10. $\frac{3x^2}{3} - \frac{24x}{3} = \frac{5}{3}$

$x^2 - 8x + 16 = \frac{5}{3} + 16$

$-8 \div 2 = (-4)^2 = 16$

$\sqrt{(x-4)^2} = \sqrt{\frac{53}{3}}$

$x - 4 = \pm\frac{\sqrt{159}}{3}$

$+4 \quad +4$

$x = 4 \pm \frac{\sqrt{159}}{3}$

6. $(x-1)^2 + 121 = 0$

$-121 \quad -121$

$\sqrt{(x-1)^2} = \sqrt{-121}$

$x - 1 = \pm 11i$

$+1 \quad +1$

$x = 1 \pm 11i$

6.3 Quadratic Formula

solving for $ax^2 + bx + c = 0$

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

Ex: Solve: $3x^2 - 4x = 8$

$-8 \quad -8$

$3x^2 - 4x - 8 = 0$

$a \quad b \quad c$

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

$$= \frac{-(-4) \pm \sqrt{(-4)^2 - 4(3)(-8)}}{2(3)}$$

$$= \frac{4 \pm \sqrt{16 + 96}}{6}$$

$$= \frac{4 \pm \sqrt{112}}{6}$$

$$= \frac{4 \pm \sqrt{16}\sqrt{7}}{6}$$

$$= \frac{4 \pm 4\sqrt{7}}{6}$$

$$= \frac{2}{3} \pm \frac{2\sqrt{7}}{3}$$

$$\frac{2 \pm 2\sqrt{7}}{3}$$

Discriminant: Tell you how many solutions there are.

$$b^2-4ac$$

1. $b^2-4ac>0$, there are 2 real solution
2. $b^2-4ac=0$, there is 1 real solution
3. $b^2-4ac<0$, there are 2 imaginary solutions

Ex: Use discriminants to determine the number of solutions to:

$4x^2-1x+3=0$

b^2-4ac

$(-1)^2-4(4)(3)$

$1-48$

-47

2 imaginary sol.

$1x^2-1x-20=0$

b^2-4ac

$(-1)^2-4(1)(-20)$

$1+80$

81

2 real solutions

Ex: $3x^2-4=0$

b^2-4ac

$(0)^2-4(3)(-4)$

48

2 real sol.

Hw: P. 389
14-52 even,
odds extra credit