

Math 92
Quiz 8.2, 8.3

1) Solve the quadratic equations using the quadratic formula;

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

a) $h^2 + 13 = 4h$

$$h^2 - 4h + 13 = 0$$

$$a = 1$$

$$b = -4$$

$$c = 13$$

$$x = \frac{4 \pm \sqrt{16 - 4(1)(13)}}{2}$$

$$x = \frac{4 \pm \sqrt{16 - 42}}{2}$$

$$x = \frac{4 \pm \sqrt{-26}}{2}$$

$$\Rightarrow \boxed{x = \frac{4 \pm i\sqrt{26}}{2}}$$

b) $2 + \frac{5}{x^2} = \frac{9}{x}$

$$x^2 \left(2 + \frac{5}{x^2} \right) = \left(\frac{9}{x} \right) x^2$$

$$2x^2 + 5 = 9x$$

$$2x^2 - 9x + 5 = 0$$

$$a = 2$$

$$b = -9$$

$$c = 5$$

$$x = \frac{9 \pm \sqrt{81 - 4(2)(5)}}{4}$$

$$x = \frac{9 \pm \sqrt{81 - 40}}{4}$$

$$\boxed{x = \frac{9 \pm \sqrt{41}}{4}}$$

2) For the following equations use the discriminant to determine what type of the number the solutions are and how many solutions exist.

$$x^2 + 4 = 0$$

$$a = 1$$

$$b = 0$$

$$c = 4$$

$$b^2 - 4ac = 0 - 4(1)(4) = -16$$

$$b^2 - 4ac < 0$$

So two complex solutions

3) Write a quadratic equation having the given numbers as solutions. $2i, -2i$

$$\begin{aligned} 0 &= (x - 2i)(x + 2i) \\ &= x^2 + 2ix - 2ix - 4i^2 \end{aligned}$$

$$0 = x^2 + 4x$$

$$x^2 + 4x = 0$$