

Algebra 2 Trig H  
1.6 day 2 Notes

Name:

1. Solve for x:  $x^2 + 3x = 4$

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

$$(x+4)(x-1) = 0 \quad x = -4, 1$$

2. Solve over the complex numbers.

a.  $m^4 + 3m^2 = 4$  let  $m^2 = x$

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

$$x = -4, 1$$

$$m^2 = -4 \quad m^2 = 1$$

$$m = \pm 2i, \pm 1$$

b.  $(p^2 - 3)^2 + 3(p^2 - 3) = 4$  let  $p^2 - 3 = x$

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

$$x = -4, 1$$

$$p^2 - 3 = -4$$

$$p^2 = -1$$

$$p = \pm i$$

$$p^2 - 3 = 1$$

$$p^2 = 4$$

$$p = \pm 2$$

c.  $(z^2 + 5z)^2 + 3(z^2 + 5z) = 4$  let  $z^2 + 5z = x$

$$x^2 + 5x = -4 \quad x^2 + 5x = 1$$

$$(z+1)(z+4) = 0$$

$$z = -1, -4$$

$$z^2 + 5z - 1 = 0$$

$$z = \frac{-5 \pm \sqrt{25 - 4 \cdot -1}}{2}$$
$$= \frac{-5 \pm \sqrt{29}}{2}$$

d.  $(a+7)^{\frac{2}{3}} + 3(a+7)^{\frac{1}{3}} = 4$  let  $(a+7)^{\frac{1}{3}} = x$

$$(a+7)^{\frac{2}{3}} = -4 \quad (a+7)^{\frac{1}{3}} = 1$$

$$a = -71$$

$$a = -6$$

3. Solve for x over the complex numbers:  $\sqrt{x-2} + \sqrt{2-x} = 1$

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

$$x-2 = 1 - 2\sqrt{2-x} + 2-x$$

$$(2x-5)^2 = (-2\sqrt{2-x})^2$$

$$4x^2 - 20x + 25 = 4(2-x)$$

$$4x^2 - 20x + 25 = 8 - 4x$$

$$4x^2 - 16x + 17 = 0$$

$$x = \frac{16 \pm \sqrt{256 - 4 \cdot 4 \cdot 17}}{8}$$

$$= \frac{16 \pm \sqrt{-16}}{8} = \frac{16 \pm 4i}{8}$$

$$= \frac{4 \pm i}{2}$$

4. Solve for x over the complex numbers:  $\sqrt{x+1} - \sqrt{x-1} = \sqrt{x+3}$

$$x+1 - 2\sqrt{x+1} \cdot \sqrt{x-1} + x-1 = x+3$$

$$x-3 = 2\sqrt{x+1} \sqrt{x-1}$$

$$x^2 - 6x + 9 = 4(x+1)(x-1)$$

$$x^2 - 6x + 9 = 4x^2 - 4$$

$$0 = 3x^2 + 6x - 13$$

$$x = \frac{-6 \pm \sqrt{36 - 4 \cdot 3 \cdot (-13)}}{6} = \frac{-6 \pm \sqrt{192}}{6} = \frac{-6 \pm 8\sqrt{3}}{6} = \frac{-3 \pm 4\sqrt{3}}{3}$$

NO solution!