M-PC Pre-Calculus Week 3

$(1-x)^2 = 9$ degree of 2 — means 2 possible solutions

square root method

$\sqrt{(1-x)^2} = \sqrt{9}$

$3 * 3 = 9$

$(-3) * (-3) = 9$

$1 - x = \pm 3$

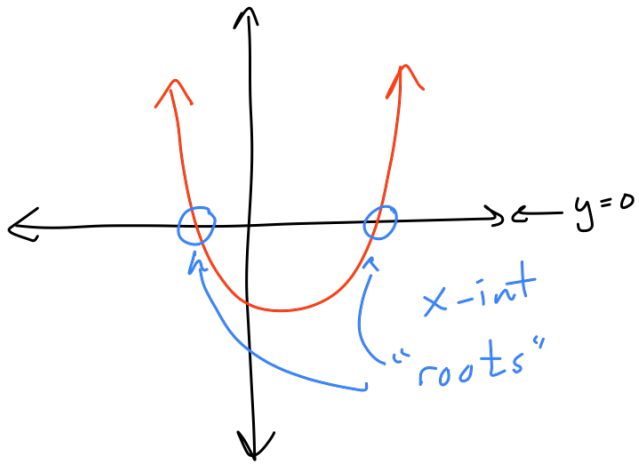
$1 - x = 3$ $\quad$ $1 - x = -3$

$-1 \quad -1$ $\quad$ $-1 \quad -1$

$-x = 2$ $\quad$ $-x = -4$

$\frac{-x}{-1} = \frac{2}{-1}$ $\quad$ $\frac{-x}{-1} = \frac{-4}{-1}$

$x = -2, 4$




$-2, 4$

$11x = 2x^2 + 12$

$-11x \quad -11x$

$0 = 2x^2 - 11x + 12$

$\ominus$ $\quad$ $\oplus$ same sign

$\frac{2x^2}{1,2}$

$2x \cdot x$

$\frac{12}{1,12 \quad 2,6 \quad 3,4}$

$2x - 1$

$= -11x$

$-25x$

| $x$ | $2x^2$ | $-x$ |
|---|---|---|
| $-12$ | $-24x$ | $12$ |

$(2x) - 3 = -11x$

| $x$ | $2x^2$ | $-3x$ |
|---|---|---|
| $-4$ | $-8x$ | $12$ |

$2 * \frac{8}{4} + 1 * \frac{3}{3} = 11$

$(2x-3)(x-4) = 0$

$(2x-3)(x-4)=0$

$2x-3=0 \quad +3\ +3$

$\frac{2x}{2}=\frac{3}{2}$

$x=\frac{3}{2}$

$x-4=0 \quad +4\ +4$

$x=4$

$\left\{\frac{3}{2}, 4\right\}$

$\{1.5, 4\}$

1.) $3x^2 + 10x - 8 = 0$ (larger ⊕; different signs)

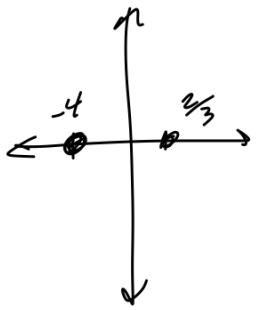
$3x^2$ : $3x \cdot x$ ; $8$ : $1, 8$ ; $2, 4$

$(3x-2)(x+4)=0$

| | $3x$ | $-2$ |
|---|---|---|
| $x$ | $3x^2$ | $-2x$ |
| $+4$ | $12x$ | $-8$ |

$= 10x$

"roots"




$3x-2=0 \quad +2\ +2$

$\frac{3x}{3}=\frac{2}{3}$

$x=\frac{2}{3}$

$x+4=0 \quad -4\ -4$

$x=-4$

2.) $x^2 + 12x + 27 = 0$ (+ ; same sign)

$9 * 3 = 27$

$9 + 3 = 12$

$(x+9)(x+3)=0$

$x+9=0 \quad -9\ -9$

$x=-9$

$x+3=0 \quad -3\ -3$

$x=-3$

$\frac{2p^2}{2} - \frac{50}{2} = \frac{0}{2}$

$p^2 - 25 = 0$ (square ; square)

Difference of squares

$\sqrt{p^2} = \pm\sqrt{25}$

$(p+5)(p-5)=0$

$p+5=0 \quad -5\ -5$

$p-5=0 \quad +5\ +5$

$-5, 5$

$p=\pm 5$

$\sqrt{(3x+8)^2} = \sqrt{12}$

$3x+8 = \pm\sqrt{12}$

$3x+8 = \pm 2\sqrt{3}$

$\sqrt{12}$

$\sqrt{4}\ \sqrt{3}$

$2\sqrt{3}$

12

$4 * 3$

$\sqrt{4}\sqrt{3} = 2\sqrt{3}$

$3x+8 = 2\sqrt{3}$

$-8 \quad -8$

$\frac{3x}{3} = \frac{2\sqrt{3}-8}{3}$

$x = \frac{2\sqrt{3}-8}{3}$

$3x+8 = -2\sqrt{3}$

$-8 \quad -8$

$\frac{3x}{3} = \frac{-2\sqrt{3}-8}{3}$

$x = \frac{-2\sqrt{3}-8}{3}$

$x = \frac{\pm 2\sqrt{3}-8}{3}$

$3x^2 + 10x - 8 = 0$

$ax^2 + bx + c = 0$

$a=3 \quad b=10 \quad c=-8$

$a=3 \quad b=10 \quad c=-8$

Quadratic formula

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

$$\frac{-(10) \pm \sqrt{(10)^2-4(3)(-8)}}{2(3)}$$

$\sqrt{b^2-4ac}$ discriminant

$b^2-4ac > 0$ 2 roots

$b^2-4ac = 0$ 1 root

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

$$\frac{-10 \pm \sqrt{100+96}}{6} = \frac{-10 \pm \sqrt{196}}{6}$$

$$\frac{-10 \pm 14}{6}$$

$\frac{-10+14}{6} = \frac{4}{6} = \frac{2}{3}$ $\quad \frac{-10-14}{6} = \frac{-24}{6} = -4$

# Quadratic formula

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

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

$a = 3 \quad b = -3 \quad c = -4$

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

$$\frac{3 \pm \sqrt{9 + 48}}{6}$$

$$\boxed{\frac{3 \pm \sqrt{57}}{6}}$$

2 possible solutions
∅ real solutions
2 imaginary

$\{ 4m^2 + 7m + 8 = 0$

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

$a = 4 \quad b = 7 \quad c = 8$

$$\frac{-7 \pm \sqrt{(7)^2 - 4(4)(8)}}{2(4)}$$

$\sqrt{-79} \rightarrow \sqrt{79}\sqrt{-1}$

$\sqrt{-1} = i$

$$\frac{-7 \pm \sqrt{49 - 128}}{8}$$

$\sqrt{-79} = i\sqrt{79}$

$$\frac{-7 \pm \sqrt{-79}}{8}$$

$$\boxed{\frac{-7 \pm i\sqrt{79}}{8}}$$

$$\frac{-7 + i\sqrt{79}}{8}, \quad \frac{-7 - i\sqrt{79}}{8}$$

$\sqrt{-32} = \sqrt{32}\sqrt{-1} = i\sqrt{32}$

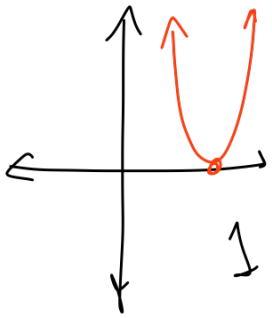
$\sqrt{32}$

$\sqrt{16}\ \sqrt{2}$

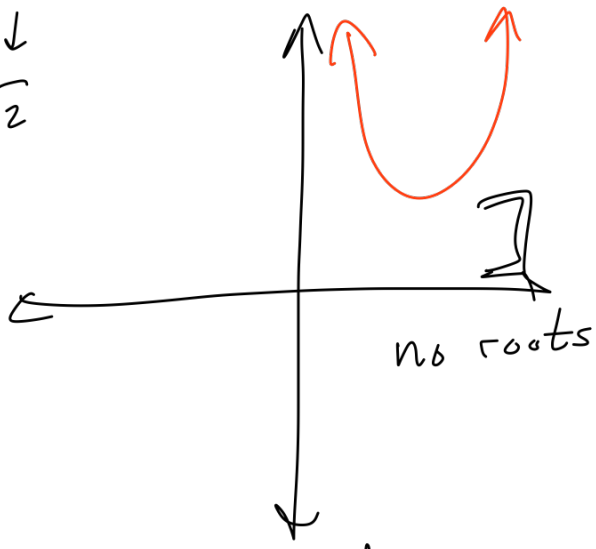
$\sqrt{-32} = \sqrt{-1} \cdot \sqrt{16} \cdot \sqrt{2}$

$i \cdot 4 \cdot \sqrt{2}$

$\sqrt{-32} = 4i\sqrt{2}$



1 solution



no roots

Due today HW 0.2 47-73 odds

Quiz 1

HW 2 online (Wed)

HW 3 online

→ solve by factoring

→ solve by square root

solve by quadratic formula

Quiz 2 due Sep 21st

Quiz 3 due Sep 28th