

Alg 2 CLASS NOTES Monday 9-10-12

$$x^2 = 16$$

OK
 $(4)^2 = 16 \checkmark$

$$x = \pm 4$$

$$(-4)^2 = 16 \checkmark$$

$$x^2 = 15$$

$$x = \pm \sqrt{15}$$

$$(x+2)^2 = 16$$

$$x+2 = \pm 4$$

$$x = -2 \pm 4$$

$$x = \{2, -6\}$$

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

Diagram showing the relationship between the expressions:

$$\begin{array}{c} \downarrow \\ (x+2)^2 \\ \downarrow \\ (x+2)^2 \end{array}$$

$$\text{PST} \Rightarrow a^2 + 2ab + b^2 = (a+b)^2$$
$$a^2 - 2ab + b^2 = (a-b)^2$$

$$\textcircled{1} \quad N^2 - 20N + 85 = -16$$

$$N^2 - 20N + \boxed{10^2} = -91 + \boxed{100}$$

$$\downarrow \quad \downarrow$$

$$(N-10)^2 = 9$$

$$N-10 = \pm 3$$

$$N = 10 \pm 3$$

$$\boxed{N = \{7, 13\}}$$

$$\textcircled{11} \quad 6V^2 = -12V + 82$$

$$\frac{6V^2}{6} + \frac{12V}{6} = \frac{82}{6}$$

$$V^2 + 2V + \boxed{1^2} = \frac{41}{3} + \boxed{\frac{3}{3}}$$

$$\downarrow \quad \downarrow$$

$$(V+1)^2 = \frac{44}{3}$$

$$V+1 = \pm \sqrt{\frac{44}{3}}$$

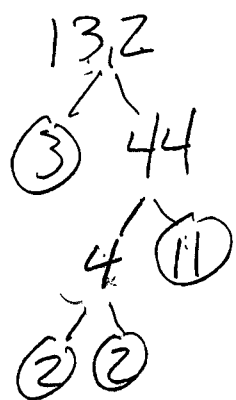
$$V = -1 \pm \sqrt{\frac{44}{3}}$$

$$\boxed{V = -1 \pm \frac{2\sqrt{33}}{3} = \frac{-3 \pm 2\sqrt{33}}{3}}$$

more common



$$\sqrt{\frac{44}{3}} = \frac{\sqrt{44}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{132}}{3}$$



$$= \frac{\sqrt{4} \sqrt{33}}{3}$$

$$= \frac{2\sqrt{33}}{3}$$

$$\frac{\left(\frac{3}{7}\right)}{2} \Rightarrow \left(\frac{3}{14}\right)^2$$

$$\frac{9}{196}$$

$$\sqrt{25} = 5$$

$$-\sqrt{25} = -5$$

$$\sqrt{-25} = \sqrt{-1 \cdot 25} = \sqrt{-1} \sqrt{25}$$

$$\stackrel{E-4}{=} 5 \sqrt{-1}$$

$$\stackrel{R1}{=} 5i$$

$$\stackrel{R2}{=}$$

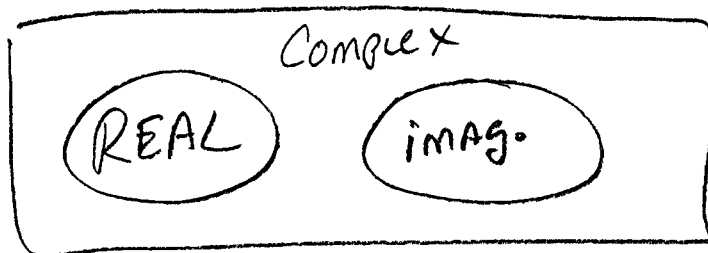
$$\stackrel{R3}{=}$$

$$\stackrel{R0}{=}$$

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$i^1 = \sqrt{-1} = i$
$i^2 = -1$
$i^3 = -i$
$i^4 = 1$

$$\stackrel{E3}{=} i^{55} = -i$$



$$a + bi$$

$$(35) \quad 12 - 2m = -4 - 2m^2$$

$$\frac{2m^2}{2} - \frac{2m}{2} = \frac{-16}{2}$$

$$m^2 - m + \left(\frac{1}{2}\right)^2 = -8 + \left\{\frac{1}{4}\right\}$$

$$\left(m - \frac{1}{2}\right)^2 = -\frac{32}{4} + \frac{1}{4}$$

$$\left(m - \frac{1}{2}\right)^2 = -\frac{31}{4}$$

$$m - \frac{1}{2} = \pm \sqrt{-\frac{31}{4}}$$

$$\left. \begin{aligned} \sqrt{-31} &= \\ \sqrt{-1} \sqrt{31} &= \\ i\sqrt{31} & \end{aligned} \right\}$$

$a+bi, a-bi$
complex
conjugates

$$m = \frac{1}{2} \pm \frac{i\sqrt{31}}{2}$$

$$m = \frac{1 \pm i\sqrt{31}}{2}$$

$$m = \left\{ \frac{1 + i\sqrt{31}}{2}, \frac{1 - i\sqrt{31}}{2} \right\}$$

CK

$$12 - 2m \stackrel{?}{=} -4 - 2m^2$$

$$12 - 2\left(\frac{1+i\sqrt{31}}{2}\right) \stackrel{?}{=} -4 - 2\left(\frac{1+i\sqrt{31}}{2}\right)^2$$

$$12 - (1+i\sqrt{31}) \stackrel{?}{=} -4 - 2\left[\frac{1^2 + 2i\sqrt{31} - 31}{4}\right]$$

$$(i\sqrt{31})^2 (i^2 \sqrt{31}^2) (-1)(31) = -31$$

$$= -4 - 2\left[\frac{-30 + 2i\sqrt{31}}{4}\right]$$

$$= -4 - \left[\frac{-30 + 2i\sqrt{31}}{2}\right]$$

$$= -4 - \{-15 + i\sqrt{31}\}$$

$$= -4 + 15 - i\sqrt{31}$$

