



Sep 23-10:02 AM

#1) $(\sqrt{5x-6})^2 = 5x-6$ $(\sqrt{a})^2 = \frac{a \cdot a}{\sqrt{a} \cdot \sqrt{a}} = \frac{a^2}{a} = a$

#2) $(7\sqrt{x} - 3\sqrt{y})(2\sqrt{x} + \sqrt{y})$
 $14x + 7\sqrt{xy} - 6\sqrt{xy} - 3y$
 $14x + \sqrt{xy} - 3y$

#3) $\frac{2}{(1-\sqrt{5})} \cdot \frac{(1+\sqrt{5})}{(1+\sqrt{5})} = \frac{2+2\sqrt{5}}{1-5}$
 $= \frac{2+2\sqrt{5}}{-4}$
 $= -\frac{(2+2\sqrt{5})}{4}$
 $= -\frac{2}{4} - \frac{2\sqrt{5}}{4}$
 $= -\frac{1}{2} - \frac{1}{2}\sqrt{5}$
 $= -\frac{1+\sqrt{5}}{2}$
 or
 $= -\frac{(1+\sqrt{5})}{2}$

Sep 23-10:18 AM

8.6 Complex Numbers

```

    graph TD
      Complex[Complex] --> Real[Real]
      Complex --> Imaginary[Imaginary]
      Real --> Rational[Rational]
      Real --> Irrational[Irrational]
    
```

$x^2 + 1 = 0$
 $\sqrt{x^2} = \pm\sqrt{-1} = \pm i$
 $x = \pm \sqrt{-1}$ what is this?
 $(?)^2 = -1$
 ↑
 Imagined that some number squared equals -1.

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

Sep 23-10:25 AM

Simplify

$$\sqrt{-4} = \sqrt{-1} \cdot \sqrt{4}$$

$$= i \cdot 2$$

$$= 2i$$

Check

⊙ $i = \sqrt{-1}$
 ⊙ $i^2 = -1$

$$(2i)^2 = -4$$

$$(2i)(2i) = -4$$

$$2 \cdot i \cdot 2 \cdot i$$

$$2 \cdot 2 \cdot i \cdot i$$

$$4 \cdot i^2$$

$$4 \cdot (-1)$$

$$-4 \checkmark$$

Sep 23-10:39 AM

$$\sqrt{-5} = \sqrt{-1} \cdot \sqrt{5}$$

$$= i \cdot \sqrt{5}$$

$$= i\sqrt{5}$$

ok

$$(i\sqrt{5})^2 = (i\sqrt{5})(i\sqrt{5})$$

$$= i \cdot i \cdot \sqrt{5} \cdot \sqrt{5}$$

$$= i^2 \cdot 5$$

$$= (-1) \cdot 5$$

$$= -5 \checkmark$$

Sep 23-10:43 AM