Homework 7 due 4/11 (Next Wednesday)

$\sqrt{ab} = \sqrt{a}\sqrt{b}$

when $a \geq 0$ & $b \geq 0$

If not, then you need to manage imaginaries.

$\sqrt{-2}\ \sqrt{-6} =$

$(i\sqrt{2})(i\sqrt{6}) =$

$i^2\sqrt{2}\sqrt{6} =$

$-1\sqrt{2}\sqrt{6} =$

$-1\sqrt{2\cdot 6} =$

$-\sqrt{12} =$

$-\sqrt{2\cdot 2\cdot 3} =$

$\boxed{-2\sqrt{3}}$

2 | 12
2 | 6
3

$\sqrt{☺^2} = |☺|$

$(y-3)^2 = 4$

I asked for absolute value management, specifically.

$\sqrt{(y-3)^2} = \sqrt{4}$

$|y-3| = \sqrt{4} = 2$

$y-3=2$ OR $y-3=-2$

$\boxed{y=5 \quad \text{OR} \quad y=1}$

is OK

$(y-3=\pm 2)$

$y=3\pm 2$

$\boxed{y=5 \quad \text{OR} \quad y=1}$

82

$(x+5)^2 = 72$

$x+5 = \pm\sqrt{72}$

$x+5 = \pm 2\cdot 3\sqrt{2}$

$x+5 = \pm 6\sqrt{2}$

$x = -5 \pm 6\sqrt{2}$

$$\begin{array}{r|l} 2 & 72 \\ 2 & 36 \\ 2 & 18 \\ 3 & 9 \\ & 3 \end{array}$$

Shortest Legal way.

$(x+5)^2 = 72$

$x+5 = \pm\sqrt{72} = \pm 6\sqrt{2}$

$x = -5 \pm 6\sqrt{2}$.

Apr 6-9:14 AM

$$\frac{4-\sqrt{48}}{2} = \frac{4-4\sqrt{3}}{2}$$

$$= \frac{\cancel{4}^{2}(1-\sqrt{3})}{\cancel{2}_{1}} = \frac{2(1-\sqrt{3})}{1}$$

$$= \boxed{2-2\sqrt{3}}$$

$$\begin{array}{l|l} 2 & 48 \\ 2 & 24 \\ 2 & 12 \\ 2 & 6 \\ & 3 \end{array}$$

$\sqrt{2\cdot2\cdot2\cdot2\cdot3}$

$= 2\cdot2\sqrt{3}$

$= 4\sqrt{3}$

$2-2x = -x$ No way

we treat 2 & $2\sqrt{3}$ ~~like~~ "unlike terms"

Shorter

$$\frac{\cancel{4}^{2}-\cancel{4}^{2}\sqrt{3}}{\cancel{2}_{1}} = 2-2\sqrt{3}$$

is ok, but beginners tend to forget to cancel with every term in the numerator.

$$\frac{4-\sqrt{48}}{2} = \frac{4-4\sqrt{3}}{2}$$

$$4i\sqrt{3}$$
$$= i4\sqrt{3}$$
$$= 4\sqrt{3}\,i$$

$$\frac{4-\sqrt{-48}}{2} = \frac{4-i\sqrt{48}}{2} = \frac{4-4i\sqrt{3}}{2}$$

$$= \frac{4(1-i\sqrt{3})}{2} = \frac{2(1-i\sqrt{3})}{1} = \boxed{2-2i\sqrt{3}}$$

Alternate (After you have done 50 of 'em.)

$$= \frac{\overset{2}{\cancel{4}}-\overset{2}{\cancel{4}}i\sqrt{3}}{\underset{1}{\cancel{2}}} = 2-2i\sqrt{3}$$

Quadratic Formula

$ax^2+bx+c=0 \Longrightarrow$

Discriminant $= b^2-4ac$

Compute 1st

why?

1. Positive: 2 different real solutions.
2. Zero: one real solution (and ax^2+bx+c is a perfect square trinomial)
3. Negative: 2 different nonreal solutions
4. It cleans up your work handling the b^2-4ac separately.

$3x^2-7x-11=0$

$a=3,\ b=-7,\ c=-11$

$b^2-4ac = (-7)^2-4(3)(-11)$

$= 49+132$

$= 181$

$\sqrt{181}$ is simplified

2, 3, 5, 7, 11, 13, 17

4, 9, 25, 49, 121, 169, 289

~~2, 3, 5, 7, 11, 13,~~ 17

4, 9, 25, 49, 121, 169, 289

So $x = \dfrac{-b \pm \sqrt{b^2-4ac}}{2a} = \dfrac{-(-7)\pm\sqrt{181}}{2(3)} = \boxed{\dfrac{7\pm\sqrt{181}}{6} = x}$

$x = \dfrac{-(-7)\pm\sqrt{(-7)^2-4(3)(-11)}}{2(3)}$ is messier for most folks, in practice.

$= \dfrac{7\pm\sqrt{181}}{6}$

Solve it

$(x-2)(x+3)=7$

Factored left side is NO HELP, unless the right side is zero!

$x^2+3x-2x-6=7$

$x^2+x-6=7$

$x^2+x-13=0$

$a=1$, $b=1$, $c=-13$

$$\boxed{x=\frac{-1\pm\sqrt{53}}{2}}$$

$b^2-4ac = 1^2-4(1)(-13)$

$= 1+52$

$= 53$ Doesn't factor.

$\sqrt{53}$ is simplified

Apr 6-9:47 AM

$25x^2 + 30x + 9 = 0$

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$a = 25,\ b = 30,\ c = 9$

$b^2 - 4ac = (30)^2 - 4(25)(9)$

$= 900 - 900$

$= 0$ means we have a perfect square trinomial

$x = \dfrac{-30 \pm \sqrt{0}}{2(25)} = \dfrac{-30}{50} = -\dfrac{3}{5}$

$25x^2 + 30x + 9$

$(5x)^2 + 2(5x)(3) + 3^2 = 0$

$(5x+3)^2 = 0$

$|5x+3| = \sqrt{0} = 0$

$|5x+3| = 0$

$5x + 3 = 0$ or ~~$5x + 3 = -0$~~

$5x = -3$

$\boxed{x = -\dfrac{3}{5}}$

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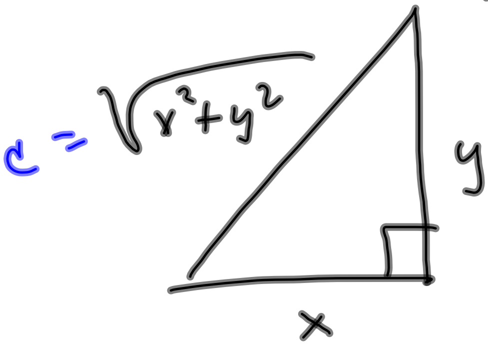
Pythagorus Says



$x^2+y^2=c^2$

$|c| = \sqrt{x^2+y^2}$

$c = \pm\sqrt{x^2+y^2}$ ¢

we always take the positive.

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