

Quiz Friday over the homework
you just submitted, today.

$$\sqrt{x^2} = |x| \quad \sqrt{(x+5)^2} = |x+5|$$

$$\textcircled{2} \quad 16^{\frac{1}{4}} = \sqrt[4]{16} = \sqrt[4]{2 \cdot 2 \cdot 2 \cdot 2} = 2^{\frac{4}{4}} = 2$$

$$(2^4)^{\frac{1}{4}} = 2^{4 \cdot \frac{1}{4}} = 2^1 = 2$$

#1 on the Spring, 2010 Final

Assume everything's real.

If you do, then in #1b,

$$\textcircled{3} \quad x^2 + 2x - 8 = 0$$

$$\sqrt{294} = \sqrt{2 \cdot 3 \cdot 7 \cdot 7} = 7\sqrt{6}$$

$$\sqrt{\frac{x^2}{x^5}} = \sqrt{\frac{1}{x^3}} = \frac{1}{\sqrt{x^3}} = \frac{1}{x\sqrt{x}} \cdot \frac{\sqrt{x}}{\sqrt{x}} = \frac{\sqrt{x}}{x^2}$$

For $\sqrt{\text{mess}}$ to be real, x must be greater
than zero. $\sqrt{y^3} = y^2 \sqrt{y}$

$$\text{So } \sqrt{\frac{294 x^2 y^{-3}}{x^5 z^{-5}}} = 7\sqrt{6} \cdot \frac{\sqrt{x}}{x^2} \cdot \sqrt{\frac{z^5}{y^3}} = \frac{7\sqrt{6}x}{x^2} \cdot \frac{z^2 \sqrt{z}}{y\sqrt{y}} \cdot \frac{\sqrt{y}}{\sqrt{y}}$$

$$= \frac{7z^2 \sqrt{6xy}}{x^2 y^2} \quad \text{if we rationalize denominators.}$$

$$\sqrt{\frac{294 x^2 y^{-3}}{x^5 z^{-5}}} = 7\sqrt{6} \sqrt{\frac{z^5}{x^3 y^3}} = \frac{7\sqrt{6} \cdot z^2 \sqrt{z}}{x\sqrt{x} y\sqrt{y}} =$$

$$\frac{7z^2 \sqrt{6z}}{x\sqrt{x} y\sqrt{y}} \cdot \frac{\sqrt{x}\sqrt{y}}{\sqrt{x}\sqrt{y}} = \frac{7z^2 \sqrt{6xy}}{x^2 y^2}$$

$$\frac{(2^3 x^{-1} y^5)^2}{(6^{-2} x^2 y^{-1})^{-2}} = \frac{2^6 x^{-2} y^{10}}{\underline{6^4} x^{-4} y^2} = \frac{2^6 x^2 y^8}{\underline{2 \cdot 3^4}}$$

$$= \frac{2^2 x^2 y^8}{3^4} = \boxed{\frac{4x^2 y^8}{81}}$$

$$\underline{\underline{6^4 = (2 \cdot 3)^4 = 2^4 \cdot 3^4}}$$

$$\frac{x^{-2}}{x^{-4}} = x^{-2 - (-4)} = x^2$$

$$\frac{y^{10}}{y^2} = y^{10 - 2} = y^8$$

Let $x =$ amt of 11% nitric acid (in liters)

$y =$ 30%

want 100 liters of 21%

How do we get that?

Volume
of mix

Volume of
pure alcohol

$$x + y = 100$$

\Rightarrow

$$y = 100 - x$$

$$[.11x + .3y = .21(100)] \quad 100$$

$$11x + 30y = 21(100)$$

$$11x + 30(100 - x) = 2100$$

Page 7 "Addition" method means
"Elimination"

Line thru (x_1, y_1) & (x_2, y_2)
 $(1, 1)$ & $(4, 3)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 1}{4 - 1} = \frac{2}{3}$$

$$y = m(x - x_1) + y_1$$

$$y = \frac{2}{3}(x - 1) + 1$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} \implies m(x_2 - x_1) = y_2 - y_1$$

$$\implies y_2 = m(x_2 - x_1) + y_1$$

$$y = m(x - x_1) + y_1$$

(19) Slope-Intercept: $y = mx + b$

$$y = \frac{2}{3}(x - 1) + 1 = \frac{2}{3}x - \frac{2}{3} + 1 = \frac{2}{3}x + \frac{1}{3} = y$$

(20) $f(x) = \frac{2}{3}x + \frac{1}{3}$

(21) $\frac{2}{3}x + \frac{1}{3} = y$

$$2x + 1 = 3y$$

$$2x - 3y = -1$$

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

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

$$x \in \{-4, 2\}$$

$$x^2 + 2x = 8$$

$$x^2 + 2x + 1 = 8 + 1$$

$$(x + 1)^2 = 9$$

$$x + 1 = \pm \sqrt{9} = \pm 3$$

$$x = -1 \pm 3 \begin{cases} \rightarrow x = 2 \\ \rightarrow x = -4 \end{cases}$$

$$a = 1, b = 2, c = -8$$

$$b^2 - 4ac = 2^2 - 4(1)(-8)$$

$$= 4 + 32$$

$$= 36$$

$$x = \frac{-2 \pm \sqrt{36}}{2(1)}$$

$$= \frac{-2 \pm 6}{2} \begin{cases} \rightarrow \frac{4}{2} = 2 = x \\ \rightarrow \frac{-8}{2} = -4 = x \end{cases}$$