MAT 093 Algebra Lab.

Late-Start run by Steve Mills.

Starts 9/15

1:45-3:00 pm

2 days per week.

Do WRITE DARK

Some work too faint for efficient assessment.

1.4 #104
1.5 #
1.6 #

104 @ $10 a ticket they sell 8000 tickets

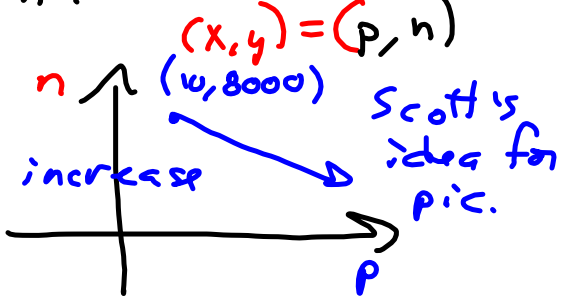
$\frac{\$10}{\text{ticket}} = 10\ \frac{\$}{\text{ticket}}$ Unit analysis.

For every $1 increase in price, 500 fewer ~~seats~~ tickets sold

We write # of tickets, n, sold as a function of price p of a ticket in $.

n = # of tickets sold
p = price of ticket (in $)

what kind of function is n?
A linear function.
Slope? Negative
Lose 500 tickets for $1 increase



$$\frac{-500 \text{ tickets}}{+1\ \$} = m$$

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

$n = m(p - p_1) + n_1$

$n = -500(p - 10) + 8000$

$= -500p + 5000 + 8000$

$$\boxed{n = -500p + 13000}$$

Teacher says "STOP," unless specific orders otherwise ☺

$$\left(-500\ \frac{\text{tickets}}{\$}\right)(10\ \$)$$

$$= -5000\ \left(\frac{\text{tickets}}{\$}\right)(\$)$$

1.4 Find a:

Pocket CAS

Line thru (3,4) & (7,a) has slope $\frac{2}{3}$

(x_1, y_1) (x_2, y_2)

$m = \frac{2}{3} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{a-4}{7-3} = \frac{2}{3}$

LCD: 3·4

$\frac{a-4}{4} = \frac{2}{3}$

$\frac{a-4}{4} \cdot \frac{3}{3} = \frac{2}{3} \cdot \frac{4}{4}$

$\frac{3(a-4)}{LCD} = \frac{8}{LCD}$

$3a - 12 = 8$

$3a = 20$

$\frac{3a}{3} = \frac{20}{3}$

$a = \frac{20}{3}$

$\frac{2}{x-1} < \frac{5}{x+2}$ Can't Cross-multiply

Why such a pain, Steve?

$-3x > 5$ * Need

$\frac{-3x}{-3} < \frac{5}{-3}$ optional

$x < -\frac{5}{3}$ Need

$\frac{}{-3} \quad \frac{}{-3}$

Katie caught an error in Solutions:

#71 want line $\perp$ to $x=4$

$x=4$

I did $x=0$

Still vertical

Its slope is undefined.

$m = \frac{\text{Something}}{0}$

So $m_{\perp} = \frac{-0}{\text{something}}$

$= 0.$

So change in x is zero

$\frac{y_2-y_1}{x_2-x_1}$

$= \frac{y_2-y_1}{4-4}$

(76) ¢

Line thru $(-2, 3)$, parallel to $y = \frac{1}{2}x +$ ~~____~~

$m_{\parallel} = m = \frac{1}{2}$

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

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

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

$y = \frac{1}{2}x + 4$

In standard form.

I

I screwed it up, somehow.

Katie II

$2y = x + 8$

$-x + 2y = 8$

$x - 2y = -8$

$A = B \Rightarrow A^n = B^n$ for any n (pretty much)

But $A^n = B^n$ does NOT $\Rightarrow A = B$

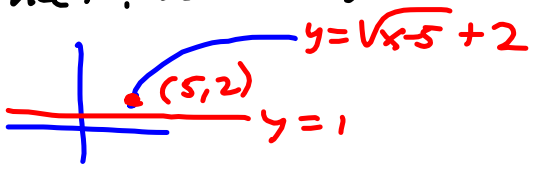
$3 = 3 \Rightarrow 3^2 = 3^2$

$9 = 9$

$3^2 = (-3)^2 \not\Rightarrow 3 = -3$

Solving Equations, we proceed from one true statement to the next.

We are also casting a net. Some fish are too small or bony.



$\sqrt{x-5} + 2 = 1$

$\sqrt{x-5} = -1$ * Nevah!

$(\sqrt{x-5})^2 = (-1)^2$

$x - 5 = 1$

$x = 6$

↳ Doesn't check.

$\sqrt{6-5} + 2$

$= \sqrt{1} + 2$

$= 3 \neq 1$

The squaring is a technique to extract x from $\sqrt{}$ but it might catch bad fish.

↳ Extraneous Solutions

When facing $x^{\frac{a}{b}} = 7$, 1st step:
raise both sides to the b power

$x^{\frac{2}{3}} = 4$

$\left(x^{\frac{2}{3}}\right)^3 = 4^3$

$x^2 = 64$

$x = \pm\sqrt{64} = \pm 8$

Something that looks legal, but loses solutions:

$x^{\frac{2}{3}} = 4$

$\left(x^{\frac{2}{3}}\right)^{\frac{3}{2}} = 4^{\frac{3}{2}} = \left(4^{\frac{1}{2}}\right)^3$

$x^{\frac{2}{3}\cdot\frac{3}{2}} = x = 2^3 = 8$

§1.5 I & §1.5 II are two
Separate assignments.
Don't staple them together.
Idiot teacher will upload 1.5 solns
momentarily

Sep 5-8:45 AM

Solve by completing the square and quadratic formula. Then factor it.

$x^2 - 2x - 1 = 0$

$x^2 - 2x + 1^2 = 1 + 1$

$(x-1)^2 = 2$

$x - 1 = \pm\sqrt{2}$

$x = 1 \pm \sqrt{2}$

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

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

$= 4 + 4 = 8$

$\sqrt{b^2 - 4ac} = \sqrt{8} = 2\sqrt{2}$

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

$= \frac{2 \pm 2\sqrt{2}}{2} =$

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

$(x - (1+\sqrt{2}))(x - (1-\sqrt{2}))$

$1^2 - \sqrt{2}^2$

$= 1 - 2 = -1$

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

$x^2 - x + \sqrt{2}x - x - \sqrt{2}x - 1$

$x^2 - 2x - 1$ ✓