Watch Test 4 video

Fix your test. Due after Thanksgiving

I'll do a separate video, based on your test, some time this week.

$3 \cdot 2^{x+1} - 4$

$f(x) = 2^x \longrightarrow f(x+1) = 2^{x+1}$

$(x, y) \longrightarrow (x-1, y)$

$\longrightarrow 3 \cdot 2^{x+1} = 3 \cdot f(x+1) = 3 \cdot 2^{x+1}$

$\longrightarrow 3 \cdot 2^{x+1} - 4 = 3 \cdot f(x+1) - 5 = 3 \cdot 2^{x+1}$

$g(x) = 3\sqrt{x+1} - 4$

$f(x) = \sqrt{x}$ (x, y)

$f(x+1) = \sqrt{x+1}$ $(x-1, y)$

$3 \cdot f(x+1) = 3\sqrt{x+1}$ $(x, 3y)$

$3 \cdot f(x+1) - 4 = g(x)$

$(x, y-4)$

$-2\log_3(-2x+6) = -2\log_3(-2(x-3))$

$\log_3(x) \longrightarrow \log_3(-2x) \longrightarrow \log_3(-2(x-3)) = y$

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

$\longrightarrow -2\log_3(-2(x-3)) = y$

$(x, -2y)$

There will be a video on this, Test 4 video that's already up is pretty good, for a slightly different test.

$$-2(-3x - y - 3z = -6)$$
$$+(-6x + y + 3z = -12)$$
$$0 + 3y + 9z = 0$$

$$3y + 9z = 0$$
$$3y = 9z$$
$$y = 3z$$
$$y = -3z$$

$$-\tfrac{1}{3}E1: \quad 1x + \tfrac{1}{3}y + z = 2$$
$$E2: \quad -6x + y + 3z = -12$$

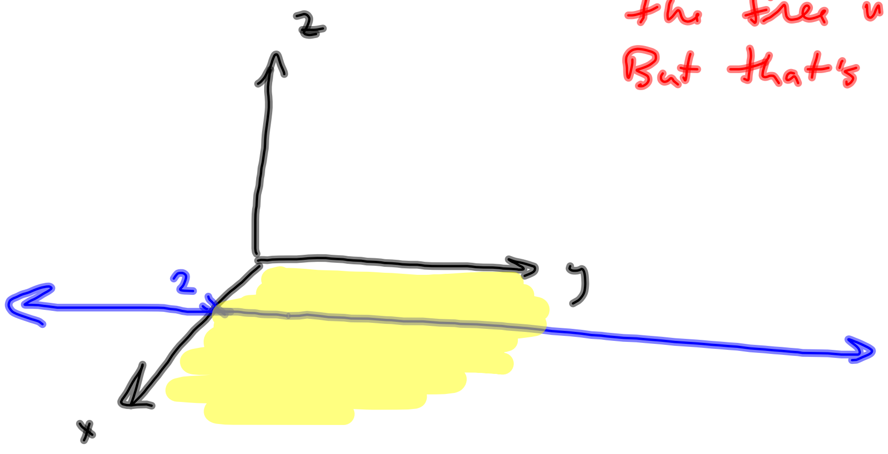
$$6E1 \quad 6x + 2y + 6z = 12$$
$$E2 \quad -6x + y + 3z = -12$$
$$6E1 + E2 \quad 3y + 9z = 0$$

$$x + \tfrac{1}{3}y + z = 2$$
$$3y + 9z = 0$$

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

unusual that the free variable vanishes, But that's OK.

$$(2, -3z, z)$$



$x = 2,\ z = 0,\ y \in \mathbb{R}$

§5.3 #10

$3x^2-4y^2=-13$
$4x^2+3y^2=16$

First, solve for x^2 & y^2

Let $w=x^2$, $z=y^2$

$3w-4z=-13$
$4w+3z=16$

$$\left[\begin{array}{cc|c} 3 & -4 & -13 \\ 4 & 3 & 16 \end{array}\right] \begin{array}{c} \frac{1}{3}R1 \\ R2 \end{array} \left[\begin{array}{cc|c} 1 & -4/3 & -13/3 \\ 4 & 3 & 16 \end{array}\right]$$

$$\begin{array}{c} R1 \\ -4R1+R2 \end{array} \left[\begin{array}{cc|c} 1 & -4/3 & -13/3 \\ 0 & \frac{25}{3} & \frac{100}{3} \end{array}\right] \begin{array}{c} R1 \\ \frac{3}{25}R2 \end{array} \left[\begin{array}{cc|c} 1 & -\frac{4}{3} & -\frac{13}{3} \\ 0 & 1 & 4 \end{array}\right]$$

$-4\left(-\frac{4}{3}\right)+3\cdot\frac{3}{3}$
$=+\frac{16}{3}+\frac{9}{3}=\frac{-7}{3}$ $\rightarrow 25$

$-4\left(-\frac{13}{3}\right)+16\cdot\frac{3}{3}$
$=+\frac{52}{3}+\frac{48}{3}=\frac{100}{3}$

$\frac{3}{25}\cdot\frac{100}{3}=4$

So, $z=4$
$y^2=4$
$\boxed{y=\pm 2}$

Now, $3x^2-4y^2=-13$
$y=2 \Longrightarrow$
$3x^2-4(2)^2=-13$
$3x^2=3$
$x^2=1 \Longrightarrow \boxed{x=\pm 1}$

$y=-2 \Longrightarrow$
$x=\pm 1$

$y=2 \Longrightarrow x=\pm 1$
$(1,2), (-1,2)$
$(1,-2), (-1,-2)$

$$xy^3 = 10^{13}$$
$$\frac{x^2}{y} = 10^{12}$$

$$y = \log(8x+16)$$
$$y = 1 + \log(x-8)$$

$$\log(8x+16) = \log(x-8) + 1$$

$$10^{\log(8x+16) - \log(x-8)} = 10^{1} \qquad 10^{\log_{10}\left(\frac{8x+16}{x-8}\right)} = 10^{1}$$

$$10^{A-B} = \frac{10^A}{10^B} = \frac{10^{\log_{10}(8x+16)}}{10^{\log_{10}(x-8)}} = 10^1 \Rightarrow \frac{8x+16}{x-8} = 10$$

$$\frac{8x+16}{x-8} = 10 \qquad \text{LCD} = x-8$$

$$\frac{8x+16}{x-8} - 10 = 0$$

$$\frac{8x+16}{x-8} - 10\left(\frac{x-8}{x-8}\right) = 0$$

$$\frac{8x+16-10(x-8)}{x-8} = 0$$

Clearing fractions would be quicker. But would NOT work on the next one.

$$\frac{8x+16-10x+80}{x-8} = 0$$

$$\frac{-2x+96}{x-8} = 0 \qquad \frac{A}{B} = 0 \text{ means } A = 0$$

$$-2x+96 = 0$$
$$-2x = -96$$
$$\boxed{x = 48}$$

$y = \log(8x+16)$
$y = 1 + \log(x-8)$

Related Problem Solve

$\log(8x+16) \geq 1 + \log(x-8)$

$10^{\log\left(\frac{8x+16}{x-8}\right)} \geq 10^{1}$

Multiplying by x−8, here, is a mistake

$\frac{8x+16}{x-8} \geq 10$

If x > 8, it stays ≥, if x < 8, it becomes ≤, & we don't know what x is!

$\frac{8x+16-10(x-8)}{x-8} \geq 0$

$\frac{8x+16-10x+80}{x-8} \geq 0$

$\frac{-2x+96}{x-8} \geq 0$

Test x = 0
$y = -\frac{96}{8} < 0$

$-2x+96 = 0$
$-2x = -96$
$\boxed{x = 48}$ is a zero
m = 1

$-2(x-48)$

$x - 8 = 0$
$\boxed{x = 8}$
m = 1

$x^2 - x - 2 = 4$

+ − +
Yes 8 No 48 Yes

From THIS, we're thinking
$(-\infty, 8) \cup [48, \infty)$

8 ∉ D of question.

Test 5 Friday. Cleaner than a lot of the homework.

Schedule a time for Test 3-4 Re-take
Signup sheet on Wednesday

Don't be discouraged.
Test 4 Video