2 Complex #s. Sum is 6, Product is 10.

5.3 FACT: If the product is real, then one is $a+bi$ & $m(a-bi)$

#73 a multiple of the conjugate of the other.

$a+bi$, $c+di$ is $a+bi$ & $c-bi$

If the sum is real, then the imaginary parts are "opposites" (additive inverse, negative).

$a+bi$, $a-bi$ for sum & product to be real.

Want $(a+bi)+(a-bi) = 2a = 6 \Rightarrow a=3$

So $\boxed{\begin{matrix}3+i\\3-i\end{matrix}}$

$(a+bi)(a-bi) = a^2+b^2 = 10 = 3^2$

$(3+bi)(3-bi) = 3^2+b^2 = 10$

$9+b^2 = 10$

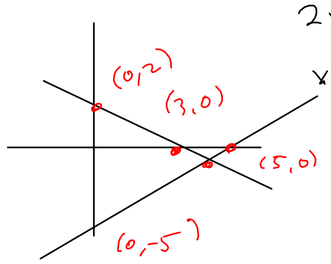
$b^2 = 1$

$b = \pm 1$

Nov 12-8:20 AM

Independent Linear System

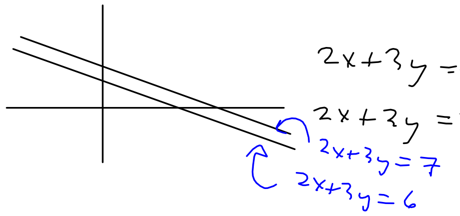
2 variables : Lines aren't parallel



$2x+3y=6$ Independent

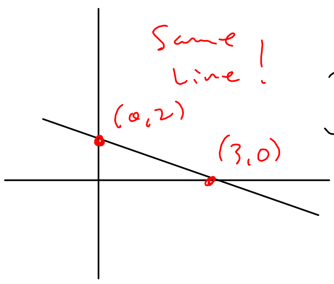
$x-y=5$ One Solution

Dependent



$2x+3y=6$ Inconsistent. No Solution

$2x+3y=7$



$2x+3y=6$ Dependent Infinitely many solutions

$4x+6y=12$ consistent

Nov 12-8:29 AM

3-D: After a bunch of work, you get to this point:

$$x - 3y + z = 11 \quad E1$$
$$y - 2z = 5 \quad E2$$
$$y - 2z = 6 \quad E3$$

$-E2 + E3$:

$-E2$: $-y + 2z = -5$

$E3$: $y - 2z = 6$

$0 = 1$?!

No solution!

Inconsistent

Dependent.

Final System:

$$x - 3y + z = 11$$
$$y - 2z = 5$$
$$0 = 1 \text{ ?!}$$

$$x - 3y + z = 11$$
$$y - 2z = 5$$
$$y - 2z = 5$$

$-E2 + E3$: $0 = 0$

Final system:

$$x - 3y + z = 11$$
$$y - 2z = 5$$
$$0 = 0$$

Dependent and consistent

Interpret:

$$y - 2z = 5$$
$$\boxed{y = 2z + 5}$$
$$x - 3y + z = 11$$
$$x = 3y + z + 11$$
$$= 3(2z + 5) + z + 11$$
$$= 6z + 15 + z + 11$$
$$\boxed{x = 7z + 26}$$

Solution Set: $\{(x, y, z) \mid x = 7z + 6,\ y = 2z + 5,\ z \in \mathbb{R}\}$

$z = 0$: $(6, 5, 0)$ is sol'n

$z = 1$: $(13, 7, 1)$ ... "

$z = 2$: $(20, 9, 2)$ ... ..

"Reductio ad absurdum" means "reduce to absurdity." This is what happens when you reason from a false premise and it is the most fundamental way we show things to be false in mathematics.

REASONING FROM A FALSE PREMISE LEADS TO THE ABSURD.

12	5.1	5.3 is difficult and tested, lightly. Keep it to what you can do in 3 hours. 5.3 is maybe THE section you want to watch ALL videos, FIRST.	11/4
	5.2		
	5.3		
	5.5		
13	8.4	WP#4 Early Bird Deadline: Friday, November 15th, (before Test 4). Smart to do WP#4, then go 8.4, 8.5	11/11
	8.5		
	WP#4		

Sections 8.4 and 8.5 are not tested over on Test 4 (unless bonus). Just trying to get the homework wiped out without killing you the last 2 weeks of school. If 8.4 and 8.5 are done before Turkey Day, then your last 2 weeks will be less stressful.

Nov 12-9:03 AM

$g(x) = -2\log_3(5x+7)+11$

x-int: $g(x)=0$:

$-2\log_3(5x+7)+11=0$

$-2\log_3(5x+7)=-11$

$\log_3(5x+7) = \frac{-11}{-2} = \frac{11}{2}$

$3^{\log_3(5x+7)} = 3^{\frac{11}{2}}$

Book says "Write in Exponential Form," but I see students memorizing it without knowing what they're doing. So write this to get to this from this

$5x+7 = 3^{\frac{11}{2}}$

$5x = 3^{\frac{11}{2}}-7$

$x = \frac{3^{\frac{11}{2}}-7}{5}$ ⟶ EXACT! $\boxed{\left(\frac{3^{\frac{11}{2}}-7}{5},\ 0\right) = \text{x-int}}$

```
(3^(11/2)-7)/5
      82.77766925
```

$\approx (82.78, 0)$ Rounded

Make sure you can get the same result on the calculator you'll be using on the test!

Still, MOST (9 out of 10) points are getting the EXACT answer.

y-int: $(0, g(0))$:

$g(0) = -2\log_3(7)+11$ ⟶ EXACT! $\boxed{(0, -2\log_3(7)+11) = \text{y-int}}$

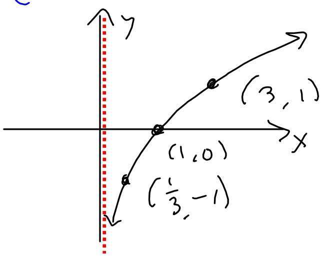
$\approx (0, 7.46)$ Rounded

```
(3^(11/2)-7)/5
      82.77766925
-2log(7)/log(3)+
11
      7.457512502
```

$\log_3(7) = \frac{\log(7)}{\log(3)}$ Change of base formula

$-5\log_3(4x+28)-11 = g(x)$

0

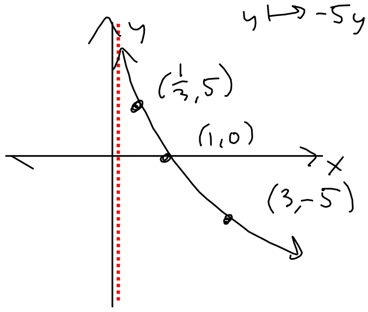


$x=0$

$f(x)=\log_3(x)$

1 $\quad -5\log_3(x) = -5f(x)$

$y \mapsto -5y$

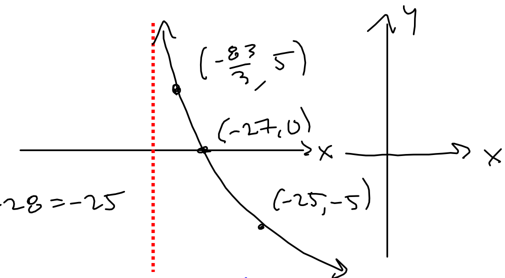


$x=0$

2 M1 $\quad -5\log_3(x+28)$

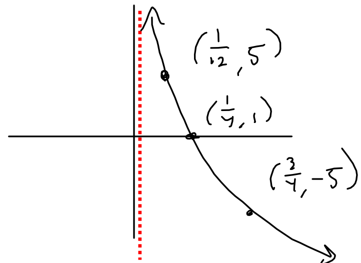
$\frac{1}{3}-28=\frac{1-84}{3}$ $\qquad x \mapsto x-28$

$3-28=-25$



2 M2 $\quad -5\log_3(4x) = -5f(4x)$

$x \mapsto \frac{1}{4}x$



3 M1 $\quad -5\log_3(4x+28) = -5f(4x+28)$

$x \mapsto \frac{1}{4}x$

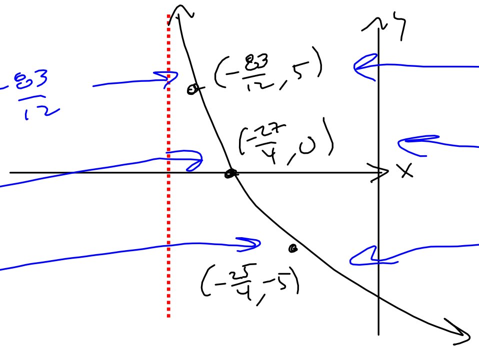
3 M2 $\quad -5\log_3(4(x+7))$

$x \mapsto x-7$

$\frac{-\frac{83}{3}}{4} = \frac{-83}{12}$

$\frac{-27}{4}$

$\frac{-25}{4}$



$\frac{1}{12}-\frac{7}{1}\cdot\frac{12}{12}=\frac{1-84}{12}=\frac{-83}{12}$

$\frac{1}{4}-\frac{7}{1}\cdot\frac{4}{4}=\frac{-27}{4}$

$\frac{3}{4}-\frac{7}{1}\cdot\frac{4}{4}=\frac{-25}{4}$