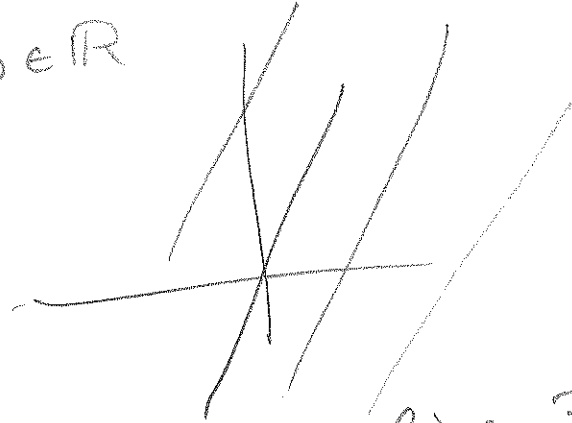
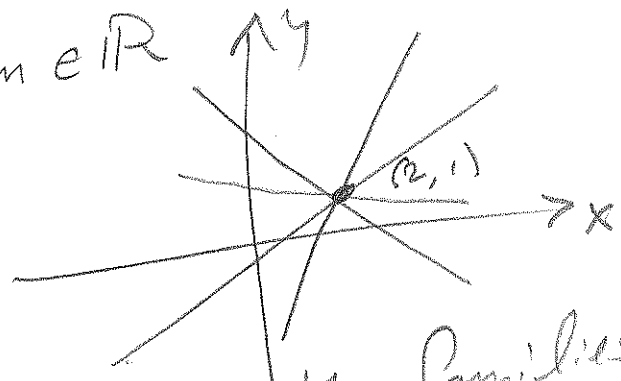


§ 1, 2 #s 5, 7, 9, 13

5 (a) Eq'n for family of linear functions with slope $m=2$ & sketch some
 $y = 2x + b, b \in \mathbb{R}$

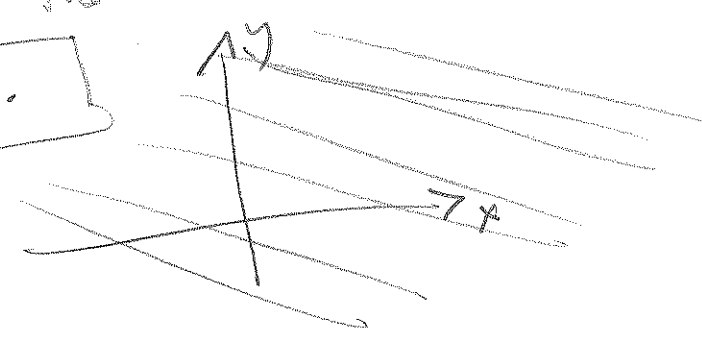


(b) Eq'n for family of lines $\exists f(2)=1$ & sketch some.
 $y = m(x-2) + 1, m \in \mathbb{R}$



(c) $f(x) = 2(x-2) + 1$ is in both families
 $f(x) = 2x - 3$

7 All members of the $f(x) = c - x$ family have slope $m = -1$.
 Sketch some.



201 §1,2 #5 9,13

9 in class. Find a cubic func $\exists f(x)=6$ and
 $f(-1)=f(0)=f(2)=0$

(M1) cubic: $f(x) = ax^3 + bx^2 + cx + d$

$$f(1) = 6 \rightarrow$$

$$a(1)^3 + b(1)^2 + c(1) + d = 6, \text{ i.e.,}$$

$$\boxed{E1} \quad a + b + c + d = 6$$

$$f(-1) = 0 \rightarrow$$

$$a(-1)^3 + b(-1)^2 + c(-1) + d = 0 \rightarrow$$

$$\boxed{E2} \quad -a + b - c + d = 0$$

$$f(0) = 0 \rightarrow$$

$$a(0)^3 + b(0)^2 + c(0) + d = 0 \rightarrow$$

$d=0$ means we can drop d in
all the eq'ns.

$$f(2) = 0 \rightarrow$$

$$a(2)^3 + b(2)^2 + c(2) + d = 0 \rightarrow$$

$$\boxed{E3} \quad 8a + 4b + 2c + d = 0$$

Now drop d & get solving:

$$E1 \quad a + b + c = 6$$

$$E2 \quad -a + b - c = 0$$

$$E3 \quad 8a + 4b + 2c = 0$$

$$E1: a + (a+c) + c = 6 \rightarrow 2a + 2c = 6$$

$$E3: 8a + 4(a+c) + 2c = 0 \rightarrow$$

$$8a + 4a + 4c + 2c = 12a + 6c = 0$$

$\boxed{E5}$

$\boxed{E4}$

(Back-sub @ end)

Send this to E1 & E3:

201 of 1, 2 #s 9, 13

(9) cont'd. NEW 2x2 system:

$$E4 \quad 2a + 2c = 6$$

$$E4 \quad a + c = 3 \rightarrow$$

$$E5 \quad 12a + 6c = 0$$

$$\rightarrow E5 \quad 2a + c = 0$$

$$a = 3 - c$$

Send to
E5

use for
back-sub.

$$E5: \quad 2a + c = 0 \text{ is now}$$

$$2(3 - c) + c = 0 \rightarrow$$

$$6 - 2c + c = 0 \rightarrow$$

$$-c = -6 \rightarrow$$

$$c = +6$$

$$\text{Back-Sub: } a = 3 - c = 3 - 6 = -3 = a$$

$$b = a + c = -3 + 6 = 3 = b$$

$$\text{So, } P(x) = -3x^3 + 3x^2 + 6x$$

(M2) Use the zeros to write factors

$$f(-1) = f(0) = f(2) = 0 \rightarrow$$

Same.

$$f(x) = a(x+1)(x)(x-2)$$

Now, $P(1) = 6$ gives

$$f(1) = a(2)(1)(-1) = 6 \rightarrow$$

$$-2a = 6 \rightarrow$$

$$a = -3 \rightarrow$$

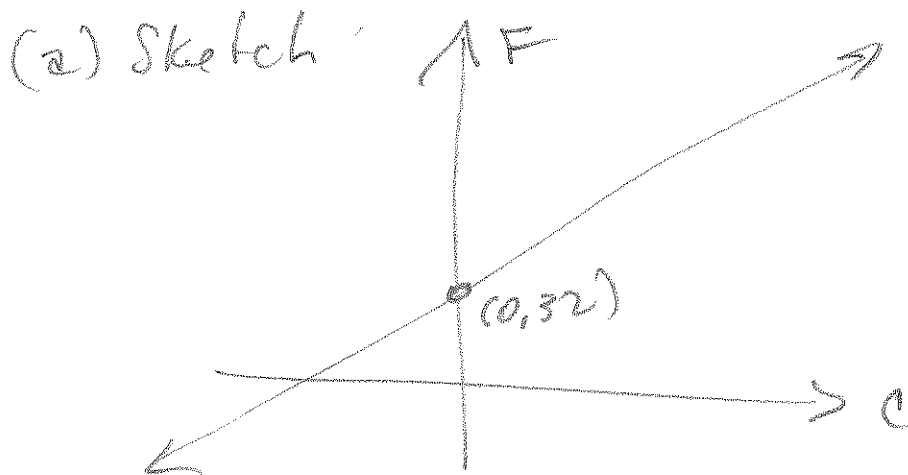
$$P(x) = -3x(x+1)(x-2)$$

201 §1.2 #s 9, 13

(9) cont'd.

I liked Amber's elimination method and I showed you the matrix (Gauss-Jordan) method in class.

(13) Fahrenheit & Celsius are related by the linear function: $F = \frac{9}{5}C + 32$



(b) Slope of graph is $\frac{9}{5}$. It means Fahrenheit temp increases by $\frac{9}{5}$ degrees whenever Celsius increases by 1 degree. The F-intercept is $(0, 32)$ and it corresponds to $0^\circ\text{C} = 32^\circ\text{F}$.