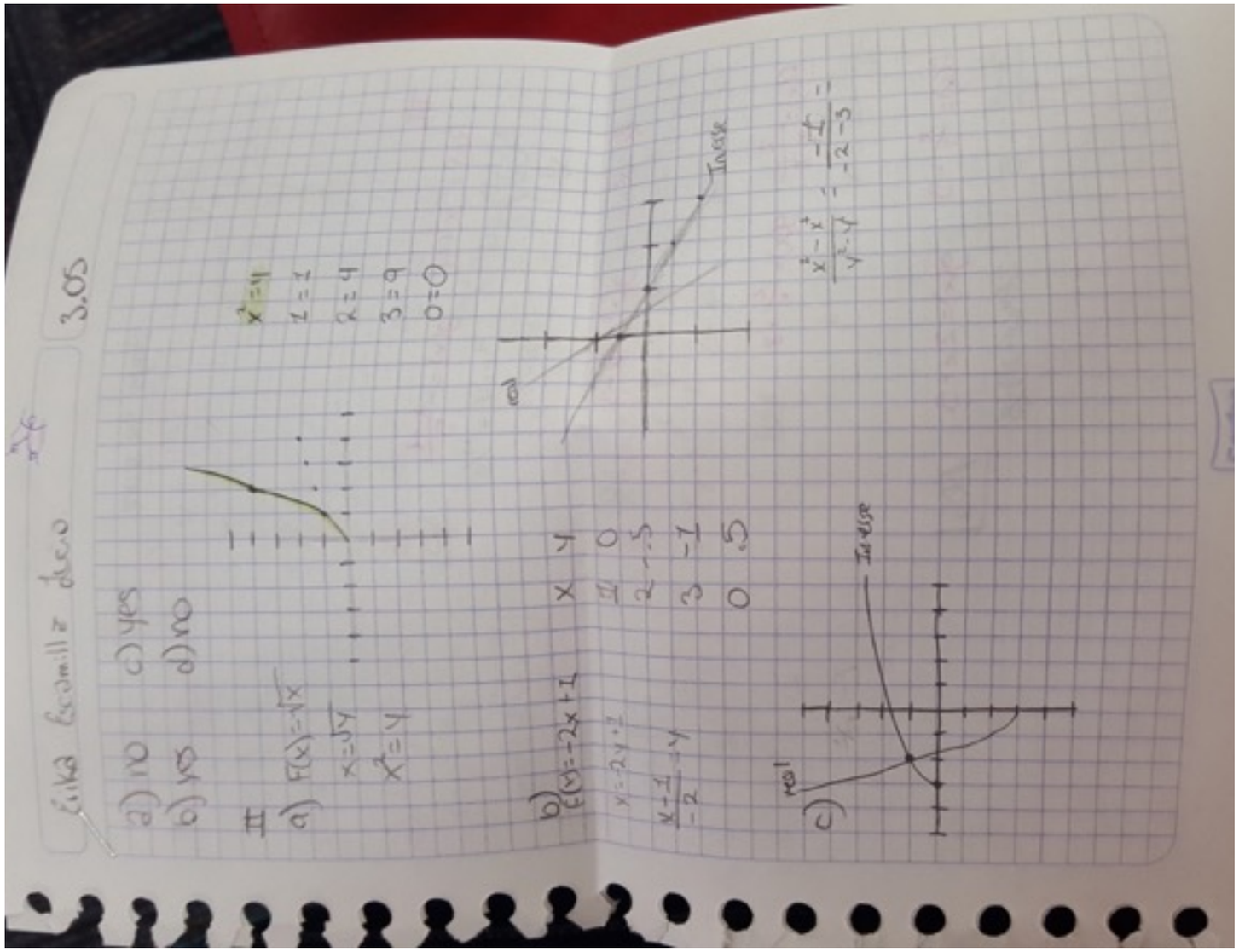
THIS ARE ALL THE ACTIVITIES THAT I HAVE



Erika Escamilla Luna

3.03

10

I.

a) yes (are to are)

b) no

c) yes

d) no

e) no

f) no

II

1- yes

2- no

3- no

III

a) yes

b) no

c) no

d) yes

e) no

f) yes

g) no

h) no

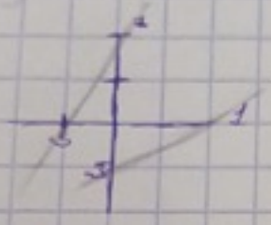
i) no

Erika Escamilla Lucio. 3.04

10

a) $2x+1$ $x = 2y+1$

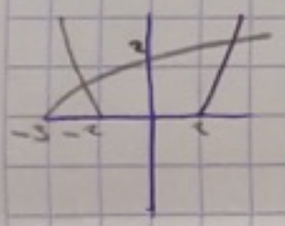
$\frac{x-1}{2} = y$



b) $f(x) x^2-3$ where $x \geq 0$

$x = y^2 - 3$

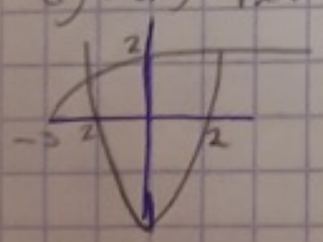
$\sqrt{x+3} = y$



c) $f(x) = -\frac{x}{3}$ $-3x = y$

d) $f(x) = \sqrt{x+3}$ $x = \sqrt{y+3}$

$x^2 - 3 = y$



Scribe

Erika Escamilla Lucio 3.02.

I

$f(x) = x^2 + 2$ and $g(x) = \sqrt{2x-1}$

10

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

$2x + 1$ $\sqrt{2x^2+3}$

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

x^2+4x+6

$f(x) = 2x + 1$ and $g(x) = x - 4$

$2(x-4)+1$ $2x-3$

$2x-7$

$2(2x+1)+1$ $(x-4)-4$

$-4x+16$

$4x+3$

$f(x) = \frac{1}{x-1}$ and $g(x) = \frac{1}{x}$

$\frac{1}{\frac{1}{x}-1}$ $\frac{1}{\frac{1}{x-1}}$

$-\frac{x}{x-1}$ $x-1$

$\frac{1}{\frac{1}{x-1}-1}$ $-\frac{x-1}{x-2}$ $\frac{1}{\frac{1}{x}}$

$-x$

Algebraic and Transcendental Functions

Tecnológico de Monterrey Preparatoria

Transformations of Functions+ the Rational Function $y=\frac{1}{x}$

By: Ing. Ziad Najjar

Name: Erika Escamilla Zecio ID Number: A01570132 Group: Unique

Transformations of Functions

Having a basic function f(x) we define the following translations and reflections (a and K stand for any real number)

$f(x)+k$ *is a shift of* $f(x)$ *by k units upwards*
$f(x)-k$ *is a shift of* $f(x)$ *by k units downwards*
$f(x+k)$ *is a shift of* $f(x)$ *by k units to the left*
$f(x-k)$ *is a shift of* $f(x)$ *by k units to the right*
$-f(x)$ *is a reflection of* $f(x)$ *over the x axis*
$f(-x)$ *is a reflection of* $f(x)$ *over the y axis*

$af(x)$ *is a vertical "stretch" of* $f(x)$ *when* $a>1$
$af(x)$ *is a vertical "shrink" of* $f(x)$ *when* $0<a<1$

I. Write the function that is obtained by:

a)	Shifting $y=\frac{1}{x}$ upward by 6 units	$y=\frac{1}{x}+6$
b)	Shifting $y=\frac{1}{x}$ by 1 unit downward and 1to the left	$y=\frac{1}{x+1}-1$
c)	Reflection of $y=\frac{1}{x}$ over the x axis and raised by 3	$y=(-\frac{1}{x})^3$
d)	Shifting of $y=\frac{1}{x}$ by 5 units to the left and 1 downwards	$\frac{1}{x+5}-1$
e)	Shifting of $y=\frac{1}{x}$ by 3 units to the right and reflected over the x axis, then shifted by 2 units upwards	$y=-\frac{1}{x-3}+2$

Algebraic and Transcendental Functions

Tecnológico de Monterrey Preparatoria

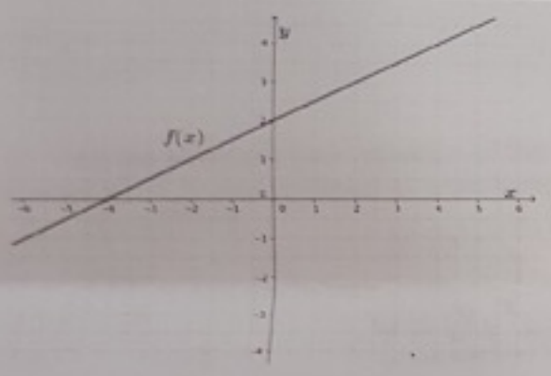
Identification of linear, quadratic and cubic functions - Self-Study 2

By: Ing. Ziad Najjar

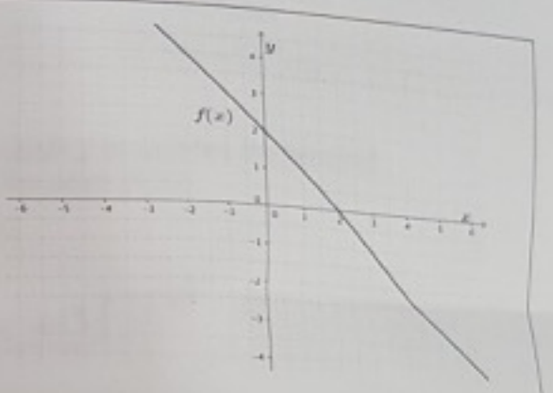
Name: Erika Escamilla Lucio ID Number: A01570177 Group: ____

Linear functions

I. For each of the following representations, write the linear function (in slope intercept form) that corresponds to it.



f(x)= 1/2x +2



f(x)= -x+2

Fill in the missing and figure out equation

x	-2	0	2	3
y	-1	7	15	19

Y = 7 + 4X

Fill in the missing and figure out equation

T(Months)	1	2	3	5
C(Pesos)	3400	3200	3000	2600

C= 3600-200x

A plumber charges $170 for showing up for a job (regardless if he does it or not), for every **half an hour** of work, he charges $50

a) Write the function that models his income (I) in terms of amount of hours worked (t).

I= 170+50t

b) What would be the plumber's income at a 180-minute lasting job?

170+50(3) 170+150 $320

Eduardo has $1,240. He tends to spend his money at a constant rate of $40 per day.

a) Write the linear function that models the amount of money he has left (M), in terms of days that have passed (t)

M=1240-40t

b) How many days will pass before he is left with $720? (write clearly the corresponding equation) 13

1240 M=1240-40(13) 1720 720 520

4.02

Algebraic and Transcendental Functions

Tecnológico de Monterrey Preparatoria

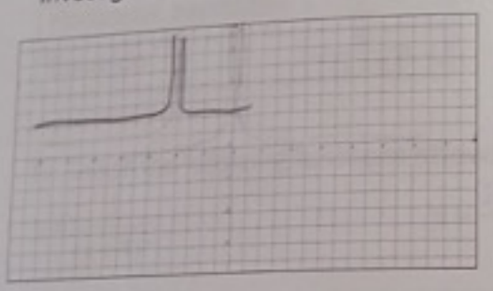
The Rational Function $y = \frac{1}{x^2}$

By: Ing. Ziad Najjar

Name: Erika Escamilla Luco ID Number: A01570432 Group: 403

Exploring the function $y = \frac{1}{x^2}$ and its elements

Investigate the graph of the function $y = \frac{1}{x^2}$, and state its characteristics. $\frac{1}{(x+2)^2} + 1$



a) Domain $\mathbb{R} - \{-2\}$ b) Range $(0, 1)$

c) Horizontal asymptote 0

d) Vertical asymptote -2

e) Increase _____ f) Decrease ✓

*** To set the domain of any rational function, we exclude the x (s) that make the denominator zero

I. Describe the translation that occurred upon the function $y = \frac{1}{x^2}$

$y = \frac{1}{(x-2)^2}$ is a shift of $\frac{1}{x}$ by 2 units to the right raised by 2

$y = \frac{1}{(x+1)^2} - 3$ is a Shift of $\frac{1}{x}$ by 1 unit to the right and 3 units downward

$y = -\frac{1}{x^2} + 1 = \frac{-1+x^2}{x^2}$ is a vertical "shrink" of $y = -\frac{1}{x^2} + 1$ when $-\frac{1}{x^2} + 1 = \frac{-1+x^2}{x^2}$

II. State the domain of the following functions.

Function	$y = \frac{-1}{x-2}$	$y = \frac{1}{(x+2)^2} + 5$	$y = \frac{3}{4-x}$	$y = -\frac{1}{x} + 5$	$y = \frac{4}{(x-7)^2} + 1$
Domain	$\mathbb{R} - \{2\}$	$\mathbb{R} - \{-2\}$	$\mathbb{R} - \{4\}$	$\mathbb{R} - \{0\}$	$\mathbb{R} - \{7\}$

Algebraic and Transcendental Functions

4.03

Rational Functions- Horizontal & Vertical Asymptotes

By: Ing. Ziad Najjar

Name: Erika Escamilla Arce ID Number: A01572432 Group: 403

Vertical and Horizontal Asymptotes of Rational Functions

A function f(x) is said to be a rational function if it is of the form $f(x)=\frac{N(x)}{D(x)}=\frac{a_n x^n+a_{n-1}x^{n-1}+\ldots+a_1x+a_0}{b_m x^m+a_{m-1}x^{m-1}+\ldots+b_1x+b_0}$, where N(x) and D(x) have no common factors.

- **The vertical asymptote** of f(x) is to be found at the zero(s) of D(x) ,in other words at the x(s) that make the denominator zero

- **The horizontal asymptote** is found by analyzing the degree of N(x) and D(x), n and m respectively

a) If n < m, the horizontal asymptote is located at y=0
b) If n = m, the horizontal asymptote of f(x) is located at y= the ratio of the leading coefficients, meaning $y=\frac{a_n}{b_m}$
c) If n > m , then f(x) has NO horizontal asymptotes

I. State the domain of the following rational functions.

Function	$f(x)=\frac{2x}{x-3}$	$f(x)=\frac{5}{x+1}$	$f(x)=\frac{4x+1}{x^2-9}$	$f(x)=\frac{2x^2-3}{5-x}$
Domain	D: R-{3}	D: R-{-1}	D: R-{-3,3}	D: R-{5}
Function	$y=\frac{2x^3+x^2}{3x-4}$	$y=\frac{x-3}{x^2+16}$	$y=\frac{x+1}{3x-6}$	$y=\frac{x+1}{(x-3)}$
Domain	D: R-{4/3}	D: R-{-4,4}	D: R-{2}	D: R-{0,3}
Function	$y=\frac{6x}{x^2+5x-6}$	$y=\frac{3+x}{x^2+2x}$	$y=\frac{x^4-2}{x^3-2x^2-3x}$	$y=\frac{x-1}{x^3-8}$
Domain	D: R-{6,-1}	D: R-{0,-2}	D: R-{0,3,-1}	D: R-{2}

$(x+6)(x-2)$ $x(x+1)$ $x(x^2-2x-3)$ $(x-3)(x+1)$

PREPA TEC – CAMPUS CUMBRES

DEPARTAMENTO DE MATEMÁTICAS

Algebraic and transcendental functions – Quiz 1 – Partial 1

83

Name Erika Escamilla Arce ID A01572432

Solve the following problems showing a clear procedure (20 points each).

1. Consider the function $f(x)=x^2-5x+3$, find the following (write simplified answers):

a) $f(3)$ -3

b) $f(-2)$ 17

c) $f(x+h)$ $x^2+2xh-4h+5x+3$ X

d) $\frac{f(x+h)-f(x)}{h}$ 1 X

-2

2. Let $f(x)=\sqrt{1-x^2}$ and $g(x)=1+x$ be two functions, find the following (simplify your answers):

a) $f\circ g(x)$ $\sqrt{2+2x+x^2}$ X

b) $g\circ f(x)$ $2-x$ X

c) $f\circ f(x)$ $\sqrt{1-\sqrt{1-x^2}}$

d) $g\circ g(3)$ $2+x$ X

Erika Escamilla Alcio | A01570432

100

A)

1

2

1

2

3

B)

i) 1.3

ii) -5

iii) 1.5

$f(-2)=-1$ $f(15/2)=8$ $f(0)=3$ $f(7)17$ $g(0)=5$

$g(\sqrt{3})=0$ $g(-2)=1$ $g(t-1)=4-t^2$ $h(-2)=0$

$h(2)=-2$ $h(\frac{1}{-4})=$ $h(7)=3$

3º

a) -2 b) 33 c) -3 d) 2/1.5

4) x^2+2x+3 | x^3+x-10 | $f=4a^2-1$