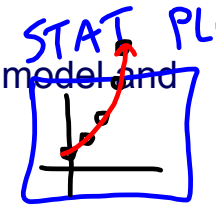
Quiz Review 1.1 - 1.3

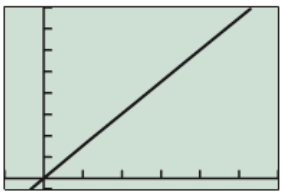
Match the numerical model to the corresponding graphical model and algebraic model.

STAT PLOT



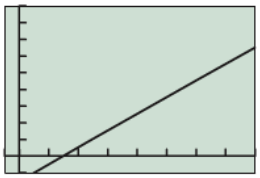
1.1 #2 L_1 L_2

x	0	1	2	3	4	5
y	2	3	6	11	18	27



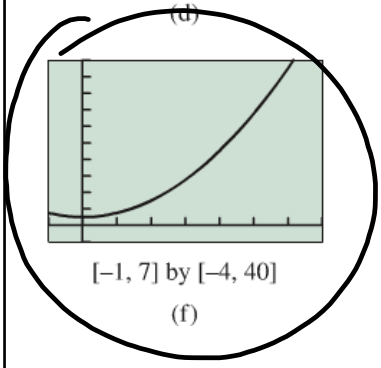
[–3, 18] by [–2, 32]

(d)



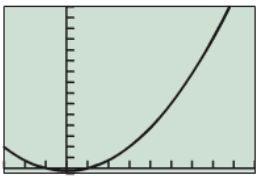
[–1, 16] by [–1, 9]

(g)



[–1, 7] by [–4, 40]

(f)



[–3, 9] by [–2, 60]

(i)

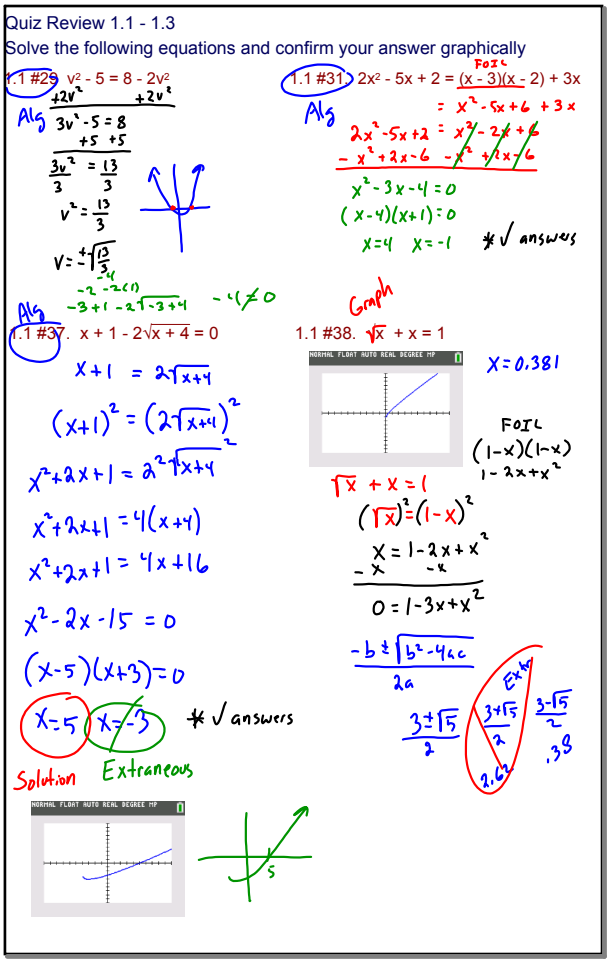
(d) $y = 40 - x^2$

(n) $y = \sqrt{x - 3}$

(p) $y = 3x - 2$

(r) $y = x^2 + 2$

(t) $y = \dfrac{x - 3}{2}$



Quiz Review 1.1 - 1.3

Solve the following equations and confirm your answer graphically

1.1 #29 $v^2 - 5 = 8 - 2v^2$

Alg

$+2v^2 \quad +2v^2$

$3v^2 - 5 = 8$

$+5 \quad +5$

$\frac{3v^2}{3} = \frac{13}{3}$

$v^2 = \frac{13}{3}$

$v = \pm\sqrt{\frac{13}{3}}$

$-2 \quad -2(0)$

$-3+1 \quad -2\sqrt{-3+4} \quad -4 \neq 0$

1.1 #31 $2x^2 - 5x + 2 = \underset{\text{FOIL}}{(x-3)(x-2)} + 3x$

Alg

$= x^2 - 5x + 6 + 3x$

$2x^2 - 5x + 2 = x^2 - 2x + 6$

$-x^2 + 2x - 6 \quad -x^2 + 2x - 6$

$x^2 - 3x - 4 = 0$

$(x-4)(x+1) = 0$

$x = 4 \quad x = -1$

* √ answers

Alg

1.1 #37. $x + 1 - 2\sqrt{x+4} = 0$

$x + 1 = 2\sqrt{x+4}$

$(x+1)^2 = (2\sqrt{x+4})^2$

$x^2 + 2x + 1 = 2^2\sqrt{x+4}$

$x^2 + 2x + 1 = 4(x+4)$

$x^2 + 2x + 1 = 4x + 16$

$x^2 - 2x - 15 = 0$

$(x-5)(x+3) = 0$

$x = 5 \quad x = -3$ * √ answers

Solution Extraneous

Graph

1.1 #38. $\sqrt{x} + x = 1$

$x = 0.381$

FOIL $(1-x)(1-x)$

$1 - 2x + x^2$

$\sqrt{x} + x = 1$

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

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

$-x \quad -x$

$0 = 1 - 3x + x^2$

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

$\frac{3 \pm \sqrt{5}}{2}$

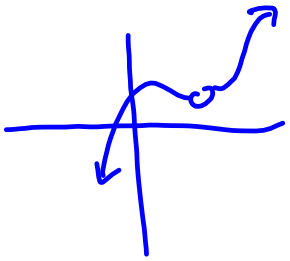
Extra

$\frac{3+\sqrt{5}}{2}$ $\frac{3-\sqrt{5}}{2}$

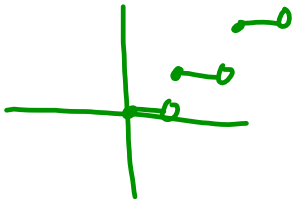
2.62 .38

Discontinuous

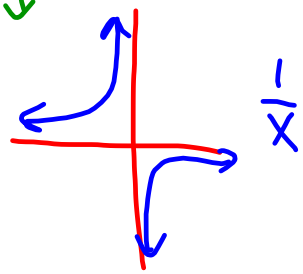
1 Removable
- hole in graph
- cancel out
- pt removed
- doesn't show up on calc



2 Jump



3 Infinite
- asymptotes



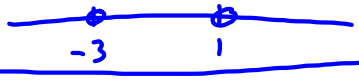
Find the domain of the function algebraically.

1.2 #11 $f(x) = \frac{3x - 1}{(x + 3)(x - 1)}$

$x + 3 = 0$, $x = -3$

$x - 1 = 0$, $x = 1$

D: $x \neq -3$, $x \neq 1$



D: $(-\infty, -3) \cup (-3, 1) \cup (1, \infty)$

1.2 #14 $h(x) = \frac{\sqrt{4 - x}}{x - 3}$

D: $x \neq 3$, $x \leq 4$

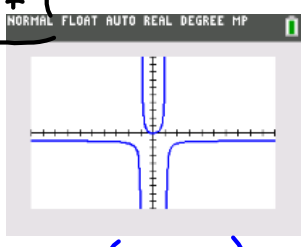
$4 - x = 0$, $4 = x$

D: $(-\infty, 3) \cup (3, 4]$

Find the range of the function

1.2 #19 $f(x) = \frac{x^2}{1 - x^2}$

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



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

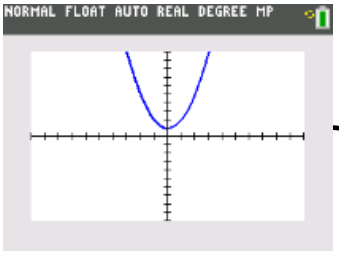
horizontal asymptote $y = -1$

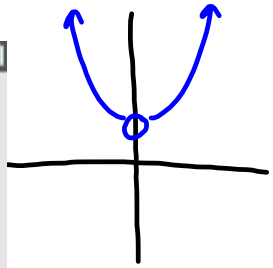
R: $(-\infty, -1) \cup [0, \infty)$

Graph the function and tell whether or not it has a point of discontinuity. If there is a point of discontinuity, tell what type it is.

1.2 #22 $h(x) = \frac{x^3 + x}{x}$

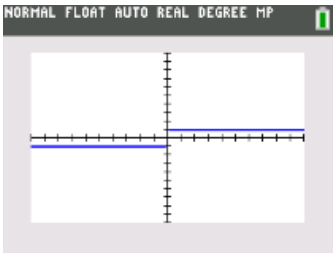
$= \frac{x(x^2+1)}{x}$





REMOVABLE DISCONTINUITY @ x = 0

1.2 #23 $f(x) = \frac{|x|}{x}$



JUMP DISCONTINUITY @ x = 0

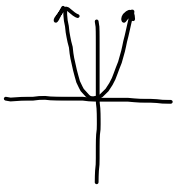
State whether the function is even, odd or neither. Support graphically and confirm algebraically.

1.2 #47 $f(x) = 2x^4$ $\boxed{f(-x) = f(x)}$

$f(-x) = 2(-x)^4 = 2(-x)^4$

$= 2x^4 = 2x^4$

EVEN

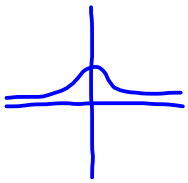


y-axis symmetry

1.2 #50 $g(x) = \frac{3}{1 + x^2}$ $f(-x) = f(x)$

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

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



EVEN

y-axis symmetry

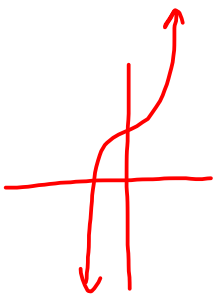
1.2 #52 $g(x) = x^3 + 0.04x^2 + 3$

$g(-x) = g(x)$

$= (-x)^3 + 0.04(-x)^2 + 3$

$= -x^3 + 0.04x^2 + 3$

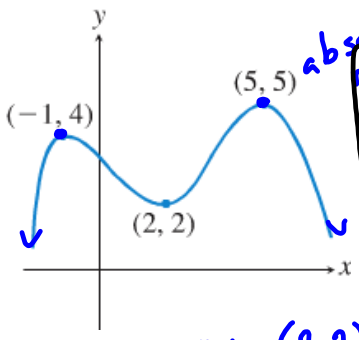
NEITHER



odd $f(-x) = -f(x)$

State whether each labeled point identifies a local min, local max or neither. Identify intervals on which the function is decreasing and increasing.

1.2 #25



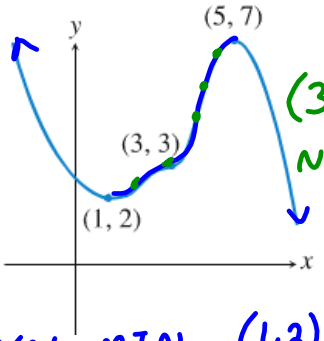
absolute max

LOCAL MAX
$y = 4$ @ $x = -1$
$y = 5$ @ $x = 5$
LOCAL MIN
$y = 2$ @ $x = 2$

LOCAL MIN (2,2)
LOCAL MAX (-1,4) (5,5)

INC $(-\infty, -1)$ and $(2, 5)$
DEC $(-1, 2)$ and $(5, \infty)$

1.2 #26



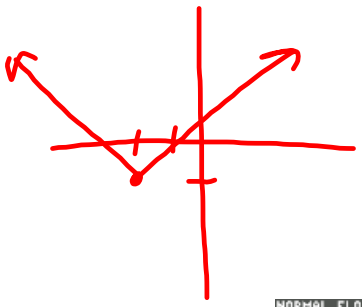
(3,3) NEITHER

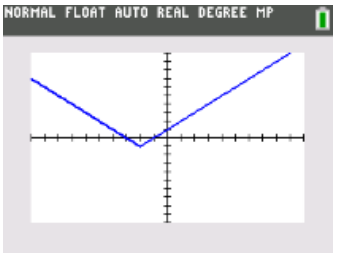
LOCAL MIN (1,2)
LOCAL MAX (5,7)

INC (1,5)
DEC $(-\infty, 1)$ $(5, \infty)$

Graph the function and identify intervals on which the function is increasing, decreasing, or constant.

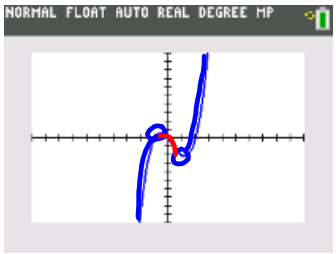
1.2 #29 $f(x) = |x + 2| - 1$





INC $(-2, \infty)$
DEC $(-\infty, -2)$

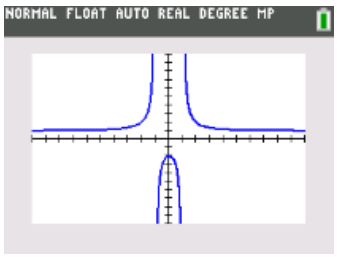
1.2 #34 $f(x) = x^3 - x^2 - 2x$



INC $(-\infty, -.548)$ $(1.215, \infty)$
DEC $(-.548, 1.215)$

Find all horizontal and vertical asymptotes of the function.

1.2 #59 $f(x) = \frac{x^2 + 2}{x^2 - 1}$ $\frac{x^2+2}{(x+1)(x-1)}$



VERT
X = 1
X = -1

$\frac{x^2}{x^2} \quad \frac{1}{1} = 1$

HORIZ Y = 1

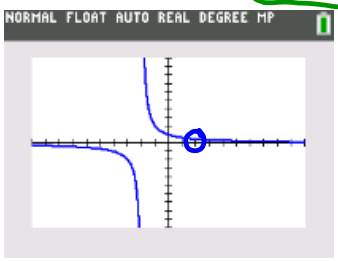
1.2 #62 $h(x) = \frac{2x - 4}{x^2 - 4}$ $\frac{2(x-2)}{(x+2)(x-2)}$

VERT
~~X = 2~~
X = -2

X = 2 hole in graph (removable)

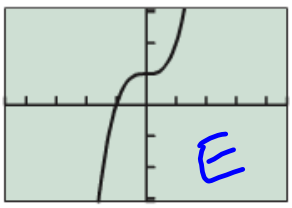
$\frac{2x}{x^2}$ 0

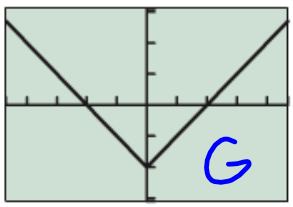
HORIZ Y = 0

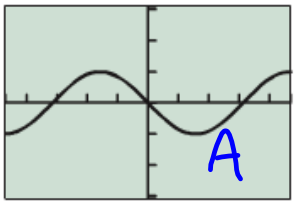


Below are graphs that are slight variations of the parent functions. Without using your calculator, match each graph to an equation given.

1.3 #1, 2 & 4

1. 

2. 

4. 

(a) $y = -\sin x$ (b) $y = \cos x + 1$ (c) $y = e^x - 2$
(d) $y = (x + 2)^3$ (e) $y = x^3 + 1$ (f) $y = (x - 1)^2$
(g) $y = |x| - 2$ (h) $y = -1/x$ (i) $y = -x$
(j) $y = -\sqrt{x}$ (k) $y = \text{int}(x + 1)$
(l) $y = 2 - 4/(1 + e^{-x})$