

Math 112

Q's

1.4

#18

Find the domain of

$$g = \frac{x^2 + 10x}{x^3 - 8x^2 + 12x}$$

Write your answer in interval notation.

Domain:

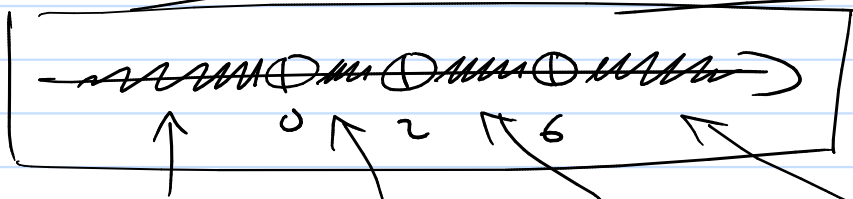
Domain: numbers that go into a function

another idea is find ones Not allowed and exclude them

$$\begin{aligned} x^3 - 8x^2 + 12x &= 0 \\ x(x^2 - 8x + 12) &= 0 \\ x(x-2)(x-6) &= 0 \\ x=0 \quad x=2 \quad x=6 \end{aligned}$$

we have a zero in domain

Domain: all reals except $x \neq 0, x \neq 2, x \neq 6$



$$\underline{(-\infty, 0)} \cup \underline{(0, 2)} \cup \underline{(2, 6)} \cup \underline{(6, +\infty)}$$

20

An open box is to be made from a flat piece of material 20 inches long and 2 inches wide by cutting equal squares of length x from the corners and folding up the sides.

Write the volume V of the box as a function of x . Leave it as a product of factors, do not multiply out the factors.

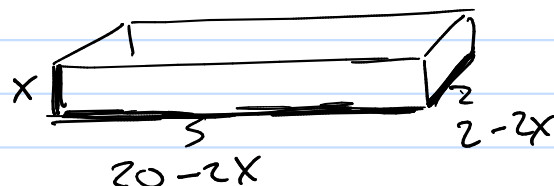
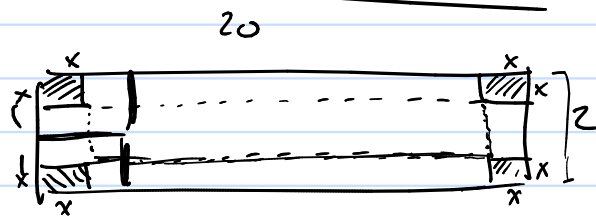
$$V(x) = x(20-2x)(2-2x)$$

If we write the domain of $V(x)$ as an open interval in the form (a, b) , then what is a ?

$a =$

and what is b ?

$b =$



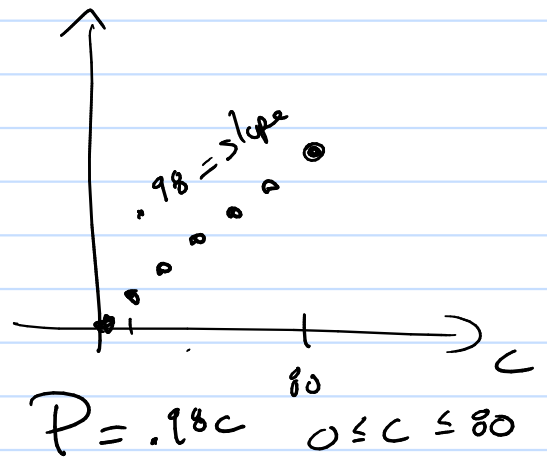
$$V = x(20-2x)(2-2x)$$

x is $(0, 1)$

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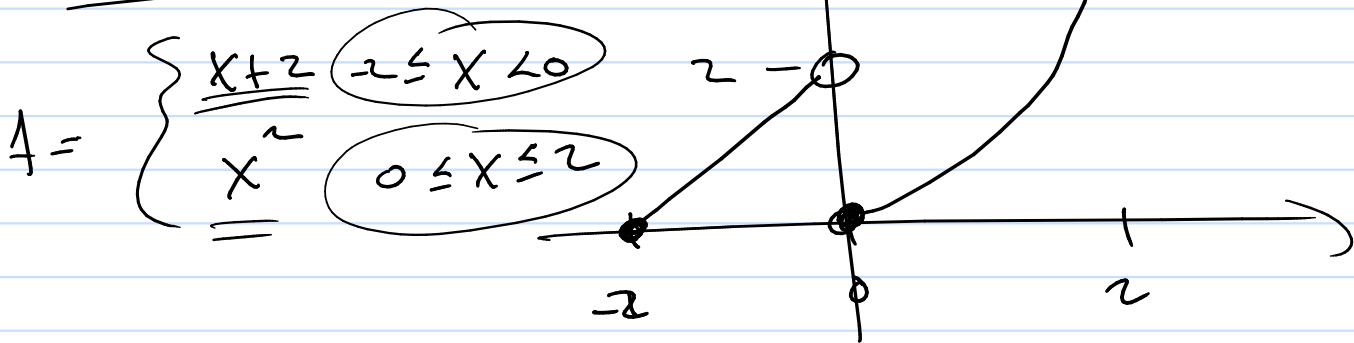
A local pet shop charges \$0.98 per cricket up to 80 crickets and \$0.92 per cricket thereafter. Write a piecewise-defined linear function which calculates the price P , in dollars, of purchasing c crickets.

$$P(c) = \begin{cases} \boxed{} & \text{if } \boxed{} \leq c \leq \boxed{} \\ \boxed{} & \text{if } c > \boxed{} \end{cases}$$



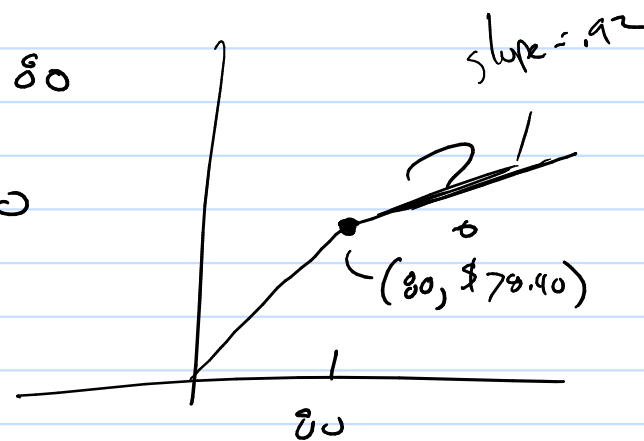
⊗

Piecewise functions

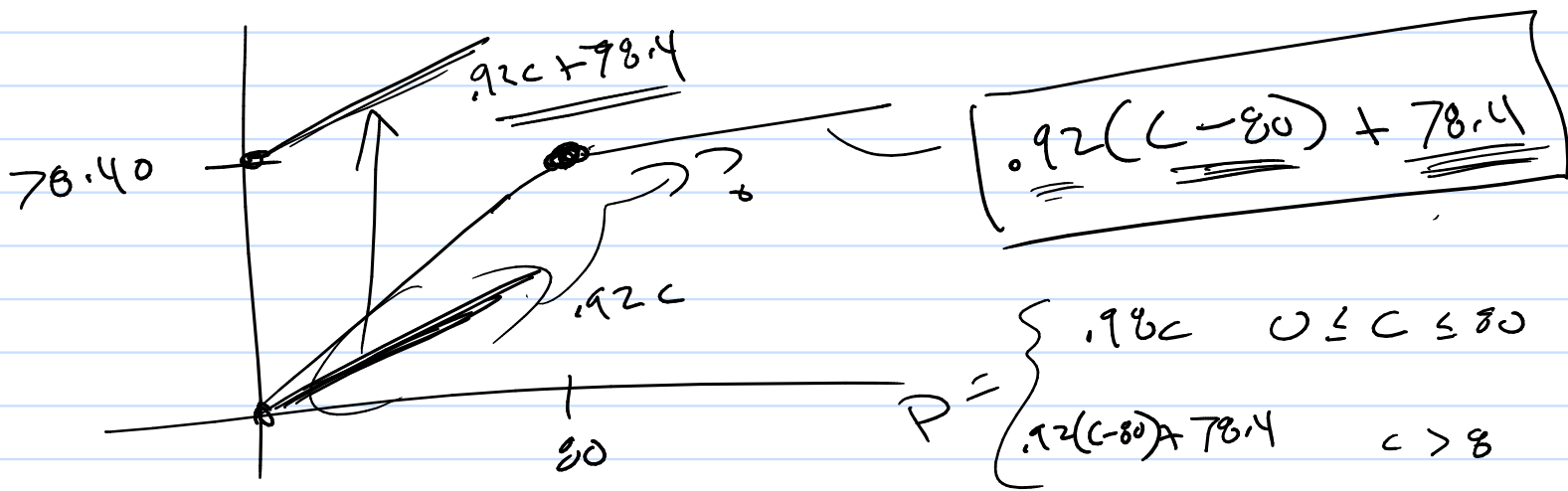


$$P = \begin{cases} .98c & 0 \leq c \leq 80 \\ \cancel{.92c} & c > 80 \end{cases}$$

$$\underline{.98 \cdot 80 = 78.40}$$



$$\underline{78.4 + .92c}$$



translations know $y = f(x)$

① $f(x) + H$ move H units up / down

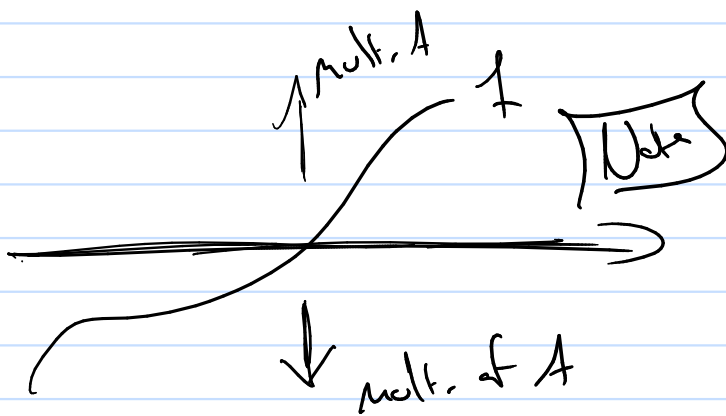
$+H$ $-H$

② $f(x + k)$ move k units left / right

$+k$ $-k$

③ $A f(x)$ "stretch" by a multiplication of

A on the height



if A is negative it

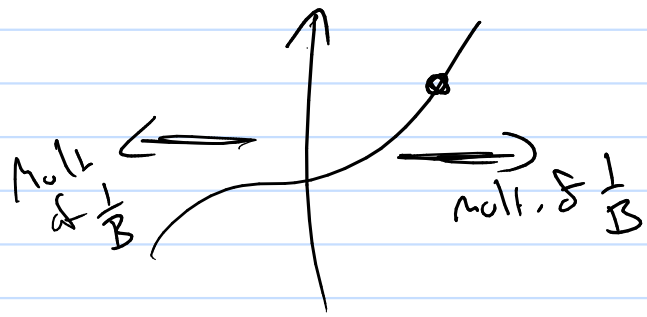
mirrors across x -axis

and stretches by $|A|$

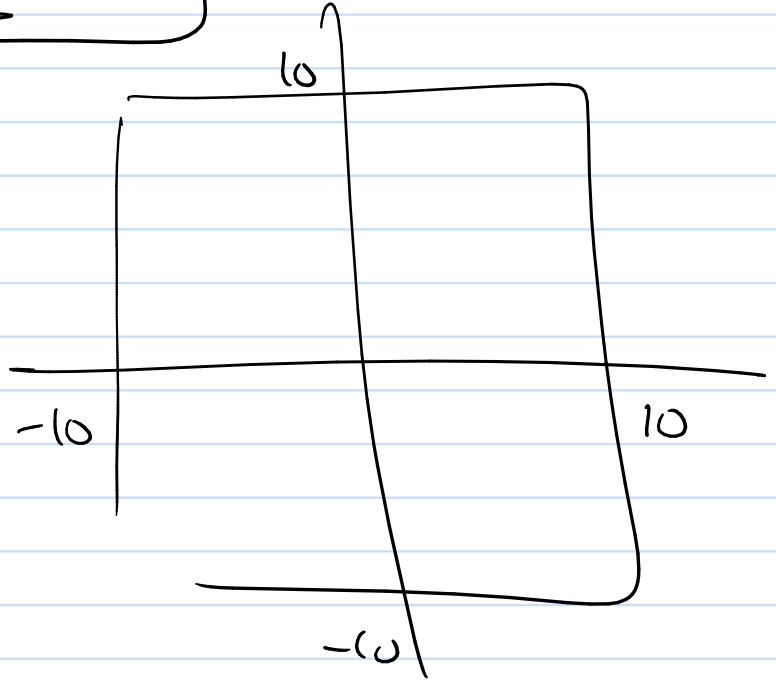
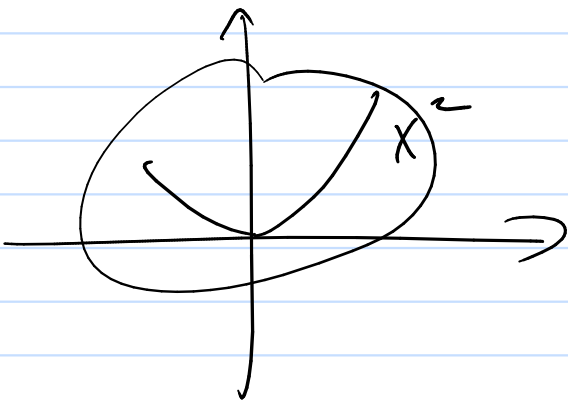
④ $f(Bx)$

"stretch" by a multiplication

of $\frac{1}{B}$ on horiz. poschas.



$$y = 3(x - 20)^2 + 10$$



ch 2 Linear Functions, Quadratic Functions, Abs. Values

Polynomial

$$y = \underbrace{a_n}_{\text{lead coeff}} x^n + \dots + a_2 x^2 + a_1 x + a_0$$

-degree

(ex) $y = 4x^{10} - 3x^3 + 2x - 1$

if n is even | or

graphs open up ↗ or down ↘

2.1

Linear

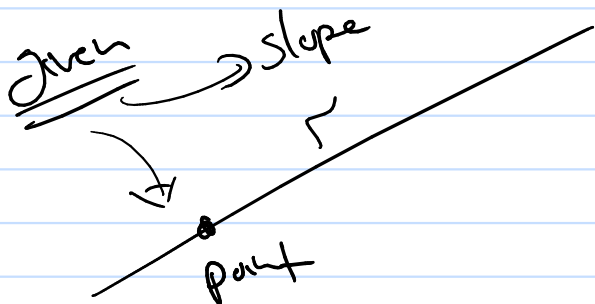
$$y = a_1x + a_0$$

called so because their graphs are lines.

Function: $y = f(x)$

$$f(x) = a_1x + a_0$$

linear function

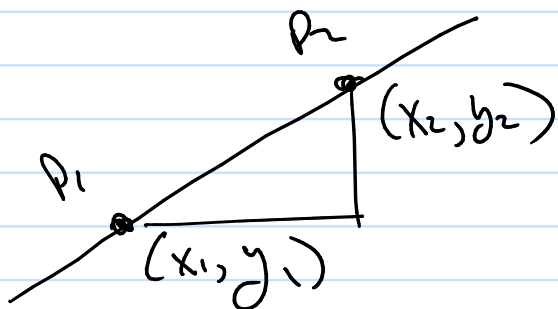


we can find the equation of a line.

why?

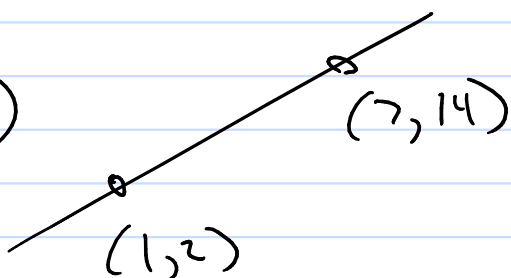
(#1)

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\text{change in vertical}}{\text{change in horizontal}}$$



$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

(ex)



$$\text{slope} = \frac{14 - 2}{7 - 1} = \frac{12}{6} = 2$$