

## 10.5 Graphing Square Root Functions

### \* Review

Function: a relation that assigns exactly one value in the range to each value of the domain

\* Square root function - a function that has the independent variable ( $x$ ) in the radicand (where the variable cannot be negative)  
\* parent function is  $y = \sqrt{x}$

Examples:  $y = \sqrt{x} + 2$  or  $y = \sqrt{x} - 4$

NOT:  $x = \sqrt{y} - 3$

\* See pg. 639 for example of  $y = \sqrt{x}$  graphed  
(A square root function does not go off to infinity in both directions. There is clearly an endpt. @  $(0,0)$  for  $y = \sqrt{x}$ )

\* Domains are limited to values of  $x$  for which the radicand is greater than or equal to 0.

\* Review Problem 1 on pg. 640

\* Got it #1)  $y = \sqrt{-2x+5}$

$$-2x+5 \geq 0$$

$$-5 \quad -5$$

$$\underline{-2x \geq -5}$$

\* Radicand cannot be negative

\* Remember to flip the inequality

by multiplying by a negative

Domains are  $x \leq 2\frac{1}{2}$

\* \*  
How does knowing the domains help you graph a square root function? Since there is not an infinite # of ordered pairs (domains), this provides you a range of domains to use to graph.

\* Review Problem 2 on pg. 640

Steps in graphing a square root function

- 1) Make a table
- 2) Plot the points

\* Got it #2) A)  $I = \frac{1}{5}\sqrt{P}$

$$\begin{aligned} 1.5 &= \frac{1}{5}\sqrt{P} \\ (1.5 = \frac{1}{5}\sqrt{P}) \cdot 5 & \\ 7.5 &= \sqrt{P} \\ 7.5^2 &= \sqrt{P}^2 \\ 56.25 &= P \end{aligned}$$

\* When the power is more than 56.25 Watts

## Vertical Translation

\* The graph  $y = \sqrt{x} + k$  is a translation of  $y = \sqrt{x}$ .

\* If  $y = \sqrt{x} + k$ , the graph translates up "k" units

\* If  $y = \sqrt{x} - k$ , the graph translates down "k" units

## Horizontal Translation

\* The graph  $y = \sqrt{x+h}$  is also a translation of  $y = \sqrt{x}$

\* If  $y = \sqrt{x+h}$ , the graph translates left "h" units

\* If  $y = \sqrt{x-h}$ , the graph translates right "h" units

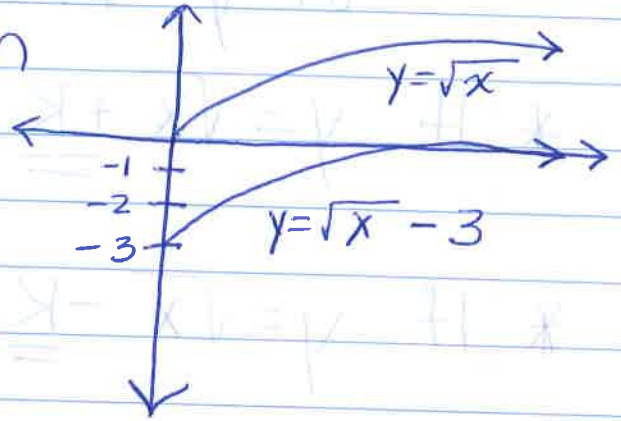
Very similar to absolute value functions.

\* Review Problem 3 & 4 on pg. 641

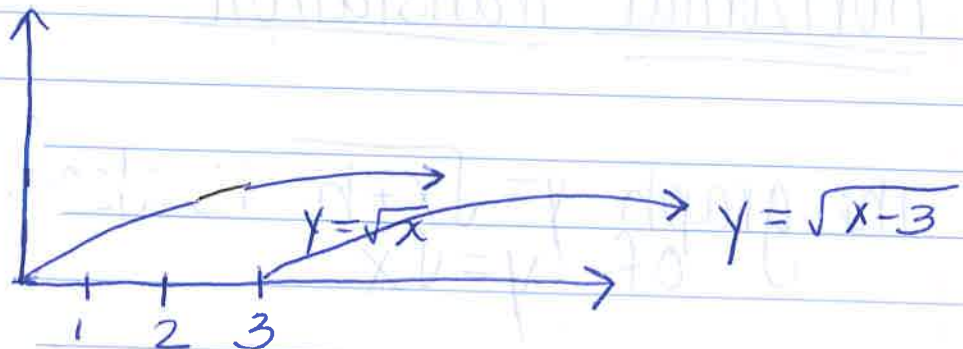
\* Got it #3) sketch

$$y = \sqrt{x} - 3$$

x	y
0	-3
4	1
9	0



\* Got it #4) sketch



x	y
3	0
12	3
19	4

\* Sketch all graphs

10.5 pg. 642 #8-24 even,  
26-40 rel,

30-38 (describe the translation)

8)  $y = \sqrt{x} + 2$

$y = \sqrt{x}$

$x \geq 0$

16)  $y = \sqrt{2x}$

x	y
0	0
2	2
4.5	3
8	4

10)  $y = 3\sqrt{\frac{x}{3}}$

$x \geq 0$

12)  $y = \sqrt{4x-13}$

$4x-13 \geq 0$

+13 +13

$4x \geq 13$

4

$x \geq \frac{13}{4}$  or  $3\frac{1}{4}$

18)  $y = \sqrt{4x-8}$

x	y
2	0
4	2.8
6	4
10	5.66

14)  $y = \sqrt{3x+9} - 6$

$3x+9 \geq 0$

-9 -9

$3x \geq -9$

3

$x \geq -3$

20)  $f(x) = 3\sqrt{x}$

x	y
0	0
4	6
9	9
16	12

\* Show graphs on website

$$22) f(x) = \frac{1}{3}\sqrt{x}$$

x	y
0	0
4	2/3
9	1
16	4/3

$$24) y = 2\sqrt{x-3}$$

x	y
3	0
7	4
12	16
19	8

$$26) D$$

$$27) A$$

$$28) C$$

$$29) B$$

$$30) y = \sqrt{x} + 5 \text{ translate up } 5$$

$$31) y = \sqrt{x} - 5 \text{ translate down } 5$$

$$32) y = \sqrt{x} - 1 \text{ translate down } 1$$

$$33) y = \sqrt{x+2} \text{ translate left } 2$$

$$34) f(x) = \sqrt{x-5} \text{ translate right } 5$$

$$35) f(x) = \sqrt{x-4} \text{ translate right } 4$$

$$36) y = \sqrt{x} + 1 \text{ translate up } 1$$

$$37) y = \sqrt{x+1} \text{ translate left } 1$$

$$38) y = \sqrt{x-1} \text{ translate right } 1$$

~~$$39) y = \sqrt{2x-8}$$

$$2x-8 \geq 0$$

$$+8 \quad +8$$

$$2x \geq 4$$

$$x \geq 2$$~~

~~$$40) y = \sqrt{8-2x}$$~~

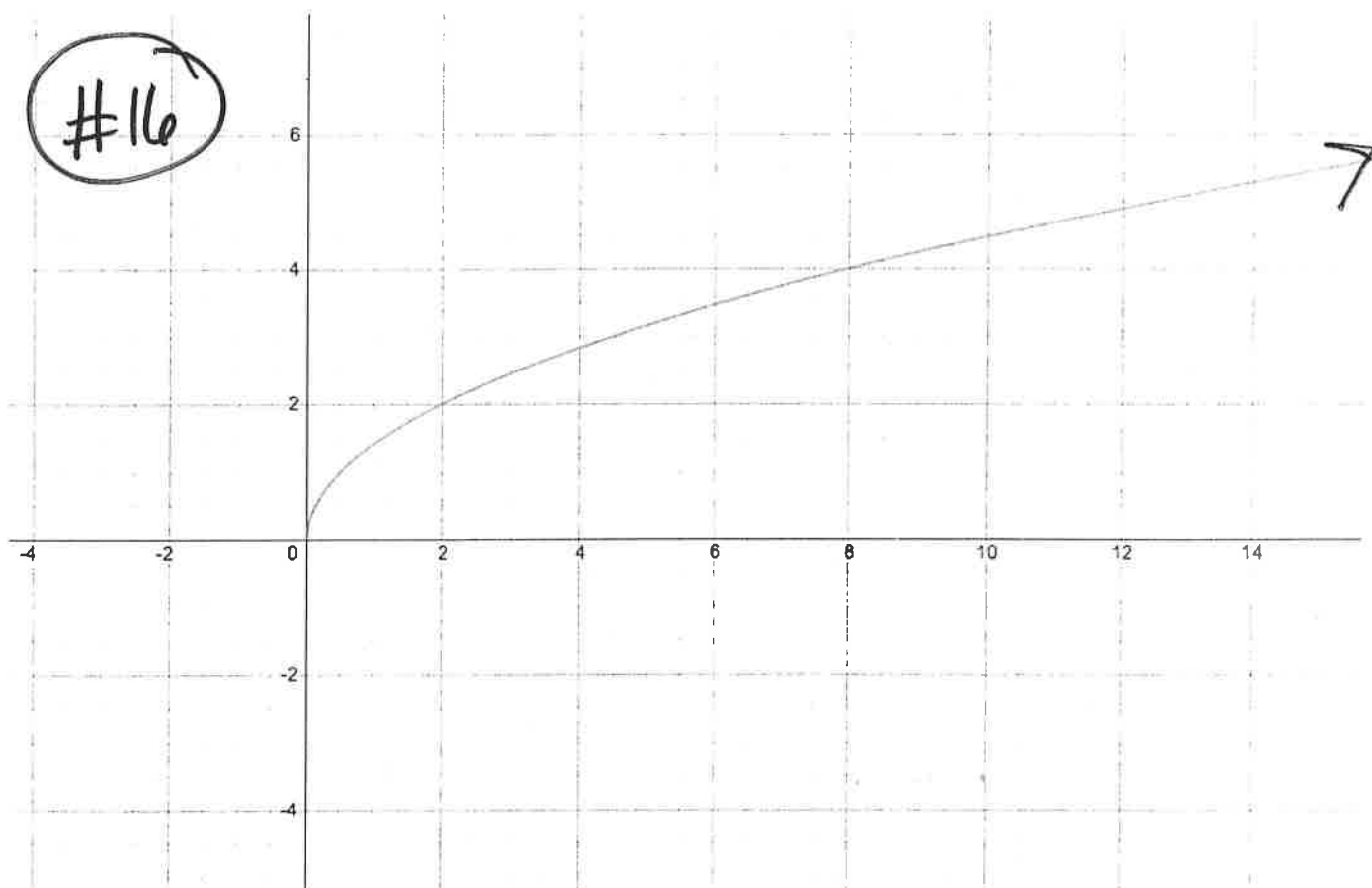
~~$$8-2x \geq 0$$

$$-8 \quad -8$$

$$-2x \geq -8$$

$$+2 \quad +2$$

$$x \leq 4$$~~

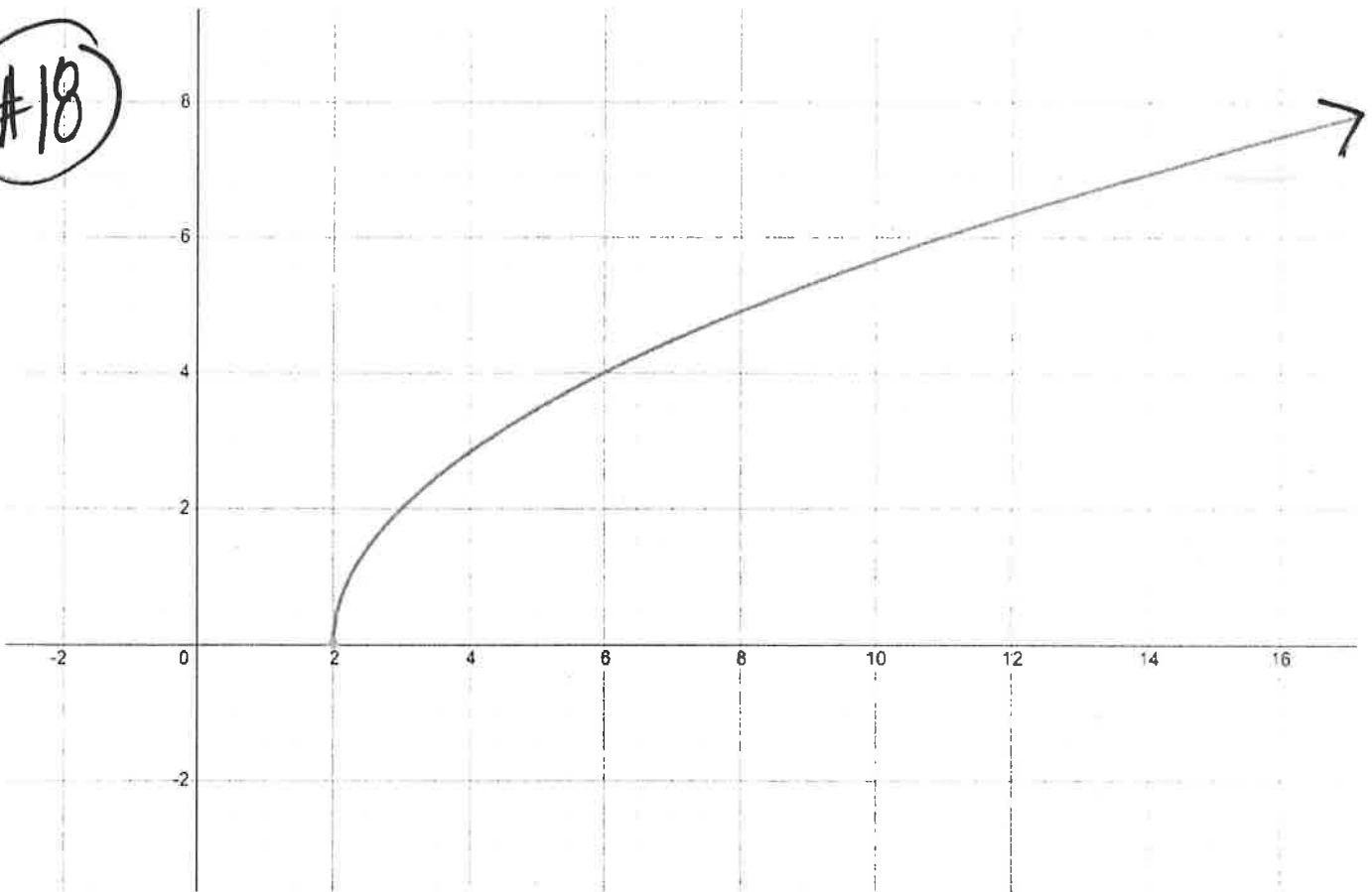


$$y = \sqrt{2x}$$

\* possible values

x	y
0	0
2	
4.5	3
8	4

#18

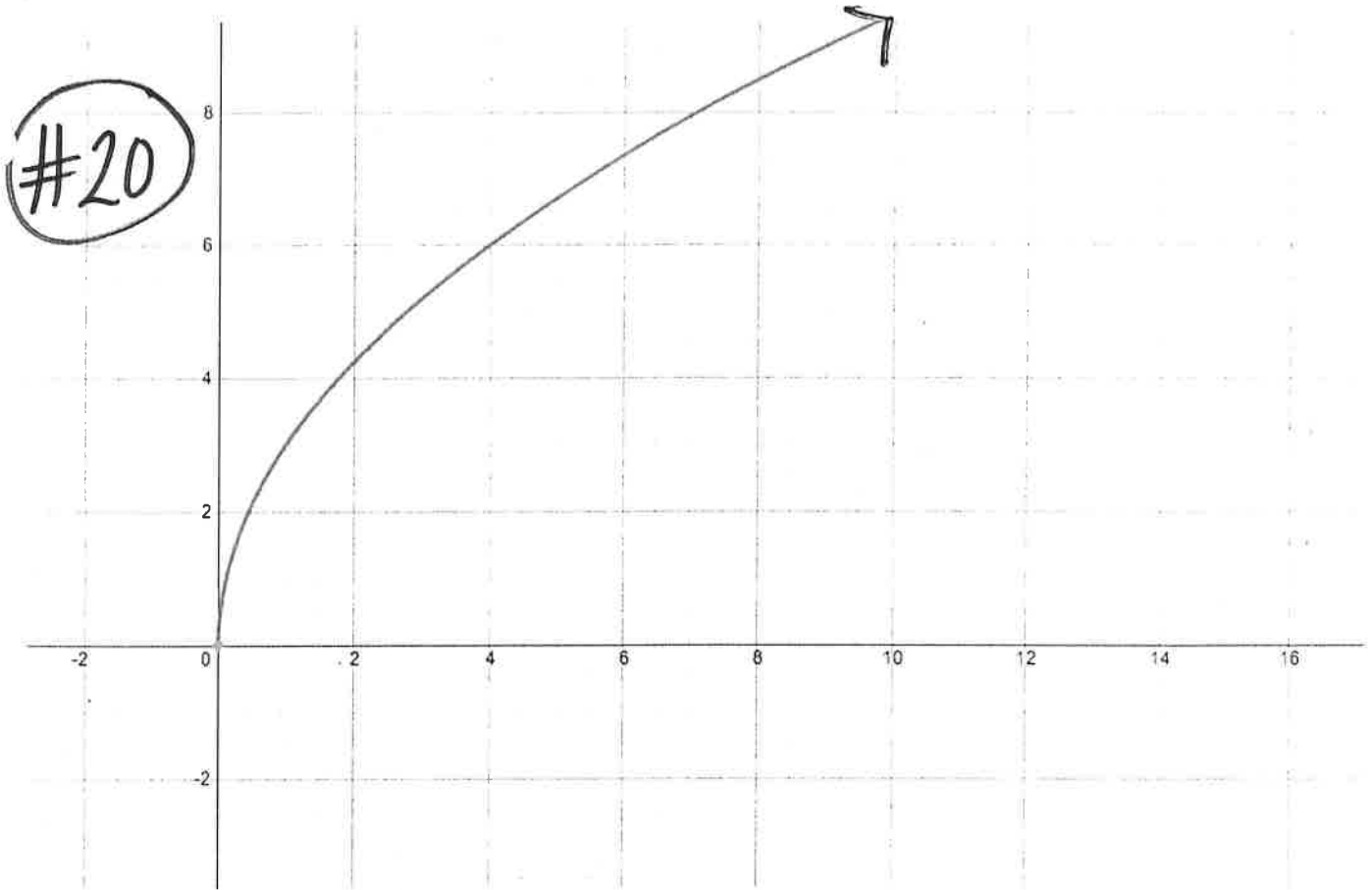


$$y = \sqrt{4x - 8}$$

\* possible values

x	y
2	0
4	2.8
6	4
10	5.66



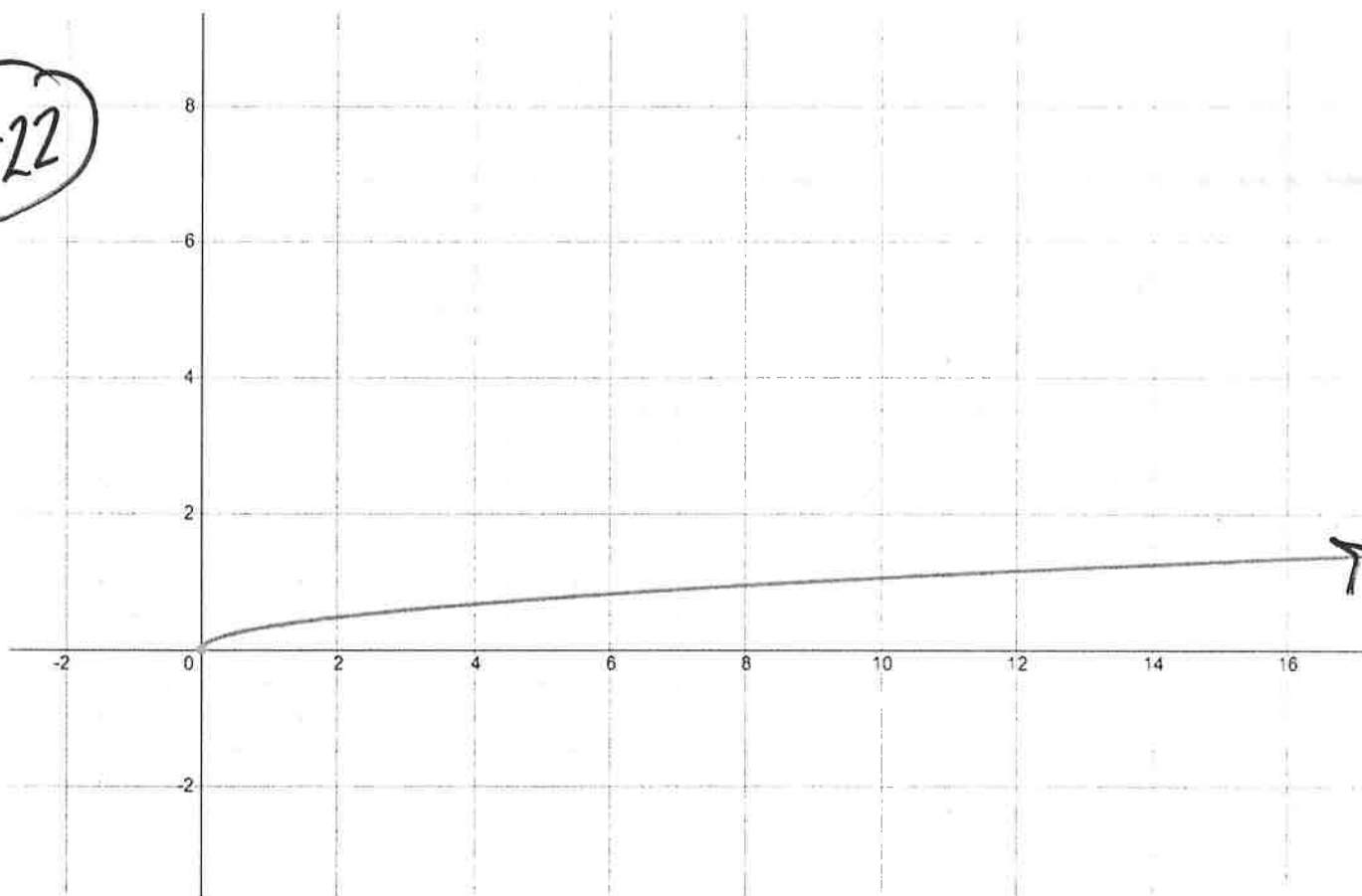


$$f(x) = 3\sqrt{x}$$

\*possible values

x	y
0	0
4	6
9	9
16	12

#22

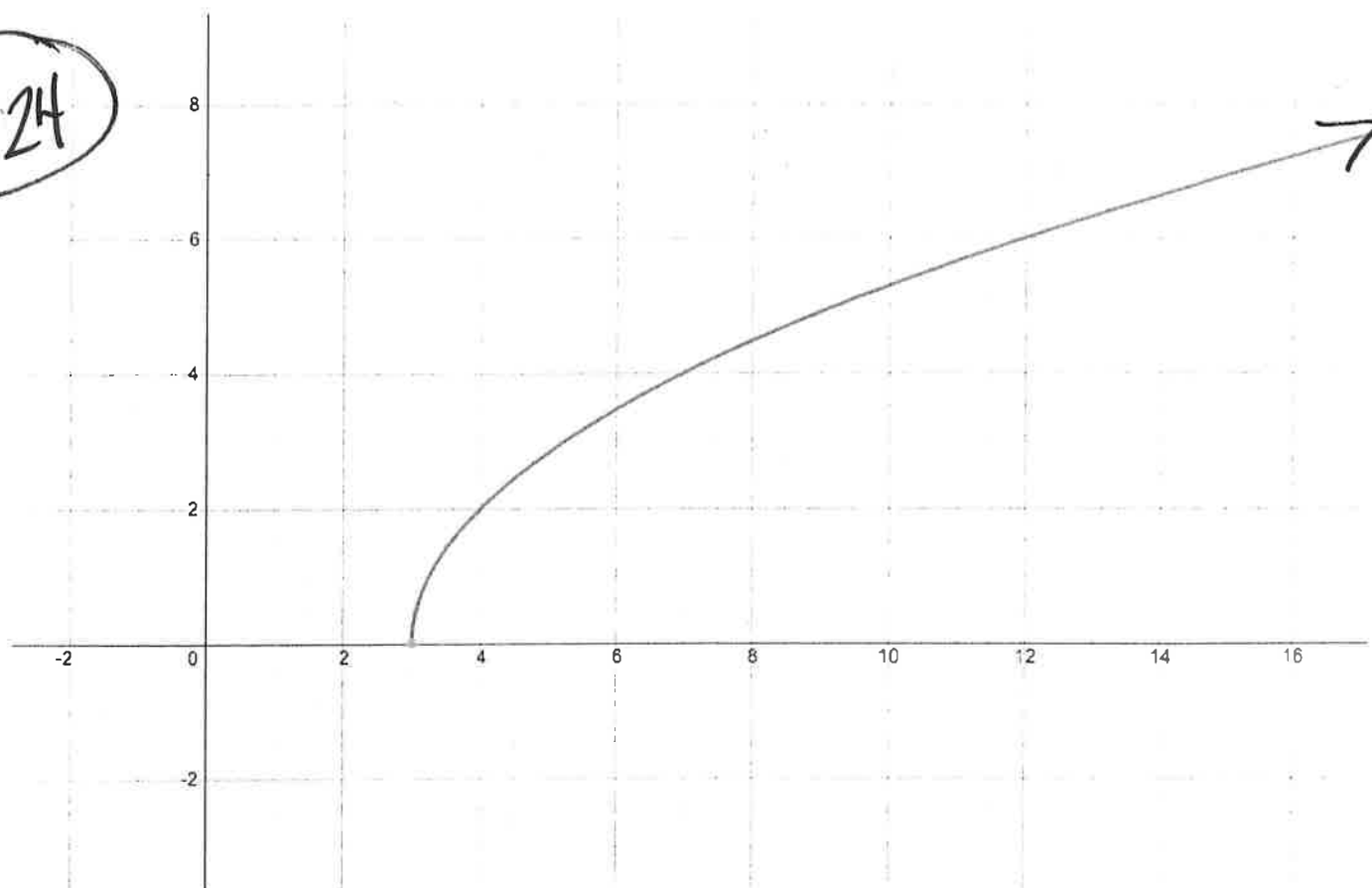


$$f(x) = \frac{1}{3}\sqrt{x}$$

\* possible values

x	y
0	0
4	$\frac{2}{3}$
9	1
16	$\frac{4}{3}$

"24"



$$y = 2\sqrt{x-3}$$

\* possible values

x	y
3	0
7	4
12	6
19	8

