

Answer Key 5

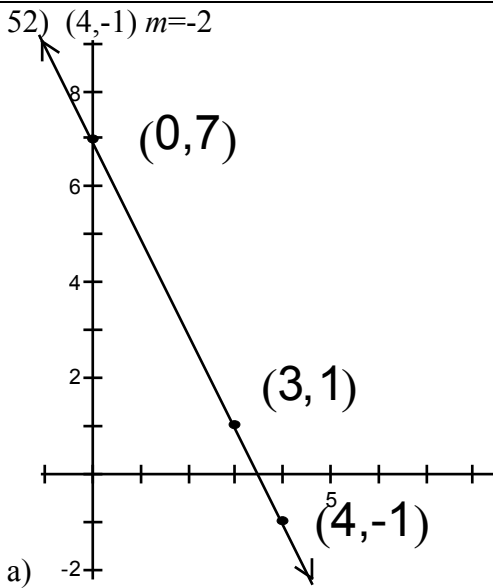
1.10: 4, 22, 31, 34, 36, 40, 43, 52, 61, 67, 78, 87

2.1: 25, 33, 35, 37, 42, 43, 44, 58, 64, 75, 86

2.2: 4, 22, 25, 45, 52, 56, 61, 64

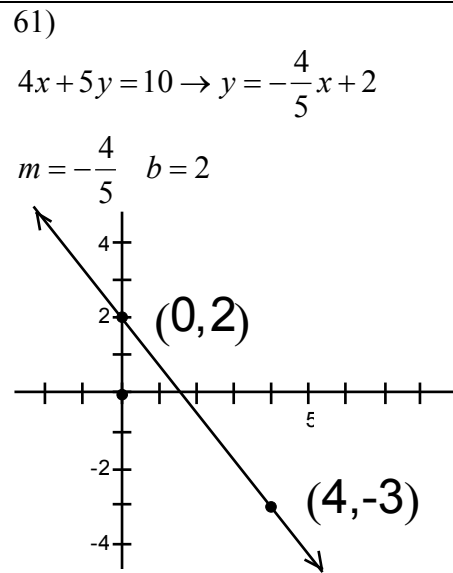
1.10

<p>4) $2x + 3y - 12 = 0$ $x = 0 \quad 3y = 12 \quad y = 4$ X-Intercept(0,4) $y = 0 \quad 2x = 12 \quad x = 6$ Y-Intercept(6,0)</p>	<p>22) Y-intercept -4 Slope $-\frac{4}{3}$ $y = -\frac{4}{3}x - 4$</p>
<p>31) $(-2, 5), (-1, -3)$ $m = \frac{\Delta y}{\Delta x} = \frac{-3 - 5}{-1 - -2} = \frac{-8}{1} = -8$ $y = -8x + b$ $5 = -8 \cdot -2 + b$ $b = -11$ $y = -8x - 11$</p>	<p>34) X-intercept (-8,0) Y-intercept (0,6) $m = \frac{\Delta y}{\Delta x} = \frac{6 - 0}{0 - -8} = \frac{3}{4}$ $y = \frac{3}{4}x + b$ $6 = \frac{3}{4} \cdot 0 + b$ $b = 6$ $y = \frac{3}{4}x + 6$</p>
<p>36) $(-1, 4)$ $m = \text{undefined}$ An undefined slope is a vertical line with equation $x = c$ $x = -1$</p>	<p>40) $(-3, 2)$ Find a \perp line to $y = -\frac{1}{2}x + 7$ Negative reciprical of $-\frac{1}{2}$ is 2 $y = 2x + b$ $2 = 2 \cdot -3 + b$ $b = 8$ $y = 2x + 8$</p>
<p>43) $(1, -6)$ find a \parallel line to $x + 2y = 6$ $2y = -x + 6$ $y = -\frac{1}{2}x + 3$ parallel lines have the same slope $y = -\frac{1}{2}x + b$</p>	<p>43) Continued $-6 = -\frac{1}{2} + b$ $b = -\frac{11}{2}$ $y = -\frac{1}{2}x - \frac{11}{2}$</p>



a)

b) $y = -2x + 7$

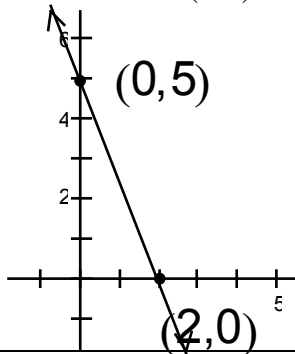


67)

$$5x + 2y - 10 = 0$$

$Y - \text{Intercept}(0, ?) \quad 2y = 10 \rightarrow y = 5 \rightarrow (0, 5)$

$X - \text{Intercept}(?, 0) \quad 5x - 10 \rightarrow x = 2 \rightarrow (2, 0)$



78)

$$y - 2x = 5 \quad 2y + 6x = 1$$

$$6y = 2x + 5 \quad 2y = -6x - 1$$

$$y = \frac{1}{3}x + \frac{5}{6} \quad y = -3x - \frac{1}{2}$$

$\frac{1}{3}$ is the negative reciprocal of -3

so lines are \perp

87)

a) $m = .02$ which means $.02$ degrees/year

15°C is the Average Temperature in 1950

b) $T = .02(2050 - 1950) + 15^\circ = 2^\circ + 15^\circ = 17^\circ$

2.1

<p>25)</p> $g(x) = \frac{1-x}{1+x}$ <table border="1" style="margin-left: 20px;"> <tbody> <tr> <td>x</td> <td>$g(x)$</td> </tr> <tr> <td>2</td> <td>$-\frac{1}{3}$</td> </tr> <tr> <td>-1</td> <td><i>undefined</i></td> </tr> <tr> <td>$\frac{1}{2}$</td> <td>$\frac{1}{3}$</td> </tr> <tr> <td>a</td> <td>$\frac{1-a}{1+a}$</td> </tr> <tr> <td>$a-1$</td> <td>$\frac{2-a}{a}$</td> </tr> <tr> <td>x^2-1</td> <td>$\frac{2-x^2}{x^2}$</td> </tr> </tbody> </table>	x	$g(x)$	2	$-\frac{1}{3}$	-1	<i>undefined</i>	$\frac{1}{2}$	$\frac{1}{3}$	a	$\frac{1-a}{1+a}$	$a-1$	$\frac{2-a}{a}$	x^2-1	$\frac{2-x^2}{x^2}$	<p>33)</p> $f(x) = \begin{cases} x^2 + 2x & \text{if } x \leq -1 \\ x & \text{if } -1 < x \leq 1 \\ -1 & \text{if } x > 1 \end{cases}$ <table border="1" style="margin-left: 20px;"> <tbody> <tr> <td>x</td> <td>$f(x)$</td> </tr> <tr> <td>-4</td> <td>8</td> </tr> <tr> <td>$-\frac{3}{2}$</td> <td>$-\frac{3}{4}$</td> </tr> <tr> <td>-1</td> <td>-1</td> </tr> <tr> <td>0</td> <td>0</td> </tr> <tr> <td>25</td> <td>-1</td> </tr> </tbody> </table>	x	$f(x)$	-4	8	$-\frac{3}{2}$	$-\frac{3}{4}$	-1	-1	0	0	25	-1
x	$g(x)$																										
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<p>35)</p> $f(x) = x^2 + 1$ $f(x+2) = (x+2)^2 + 1 = x^2 + 4x + 5$ $f(x) + f(2) = x^2 + 1 + (2)^2 + 1 = x^2 + 6$	<p>37)</p> $f(x) = x + 4$ $f(x^2) = x^2 + 4$ $(f(x))^2 = (x+4)^2 = x^2 + 8x + 16$ <p>Note we write $(f(x))^2$ as $f^2(x)$</p>																										
<p>42)</p> $h(6) - h(-3) =$ $(36+5) - (9+5) = 41 - 14 = 27$	<p>43)</p> $f(x) = 5 - 2x$ $f(a+h) = 5 - 2(a+h) \quad f(a) = 5 - 2a$ $\frac{f(a+h) - f(a)}{h} =$ $\frac{5 - 2(a+h) - (5 - 2a)}{h} = \frac{-2h}{h} = -2$																										
<p>44)</p> $f(x) = 3x^2 + 2$ $f(a+h) = 3(a+h)^2 + 2 \quad f(a) = 3a^2 + 2$ $\frac{f(a+h) - f(a)}{h} = \frac{3(a+h)^2 + 2 - (3a^2 + 2)}{h} =$ $\frac{3a^2 + 6ah + 3h^2 + 2 - 3a^2 - 2}{h} = \frac{6ah + 3h^2}{h} = 6a + 3h$	<p>58)</p> $f(x) = \frac{x^4}{x^2 + x - 6} = \frac{x^4}{(x+3)(x-2)}$ <p>Domain = $\{x \mid x \in \mathbb{R}, x \neq 2, x \neq -3\}$</p>																										

64)

$$g(x) = \sqrt{x^2 - 4}$$

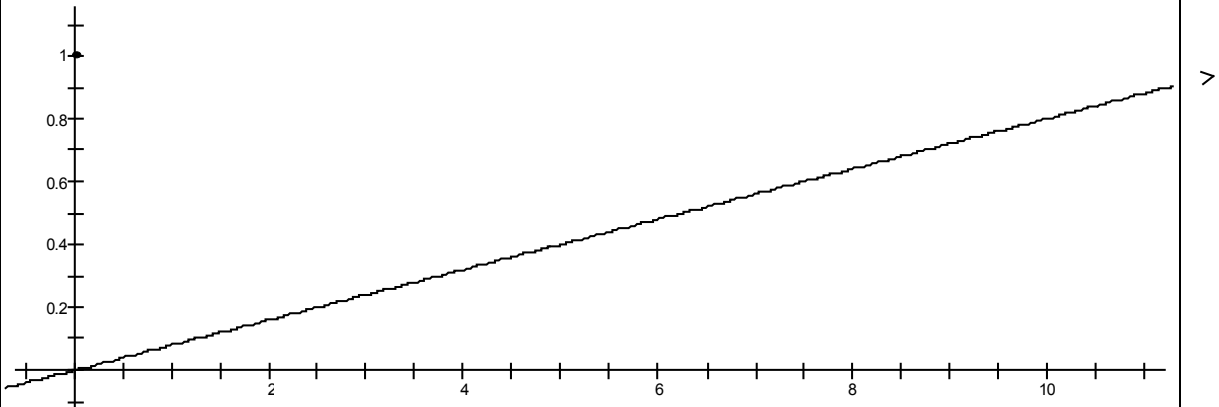
$$\text{Domain} = \{x \mid x \leq -2 \text{ or } x \geq 2\}$$

$$\text{or } (-\infty, -2] \cup [2, \infty)$$

75)

$$T(x) = .08x$$

x	$T(x)$
1	.08
2	.16
3	.24
4	.32



86)

a)

$$C(x) = \begin{cases} x+15 & \text{if } x < 100 \\ x & \text{if } x \geq 100 \end{cases}$$

$$C(75) = 15 + 75 = 90$$

$$C(90) = 15 + 90 = 105$$

$$C(100) = 0 + 100 = 100$$

$$C(105) = 0 + 105 = 105$$

b) $C(x)$ represents the total cost of a purchase.

2.2

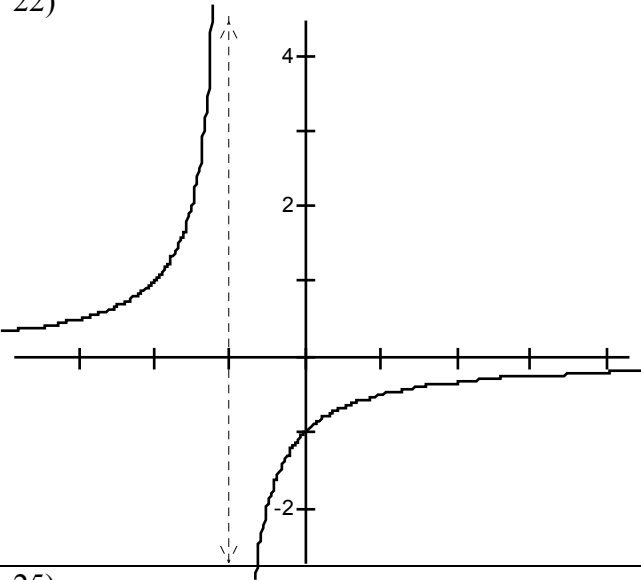
4)
a- IV b-II c-I d-III

22)

$$C(t) = -\frac{1}{t+1}$$

t	$C(t)$
-4	1/3
-3	1/2
-2	1
-1	undefined
0	-1
1	-1/2
2	-1/3

22)

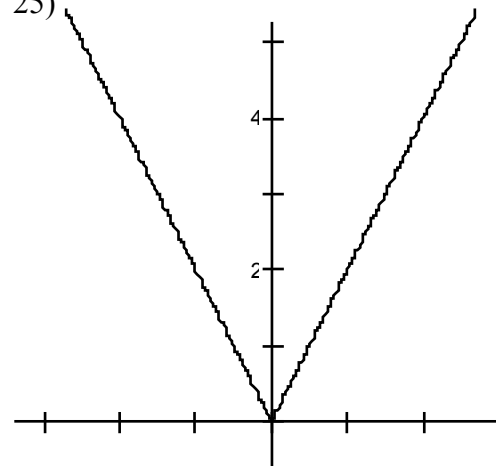


25)

$$H(x) = |2x|$$

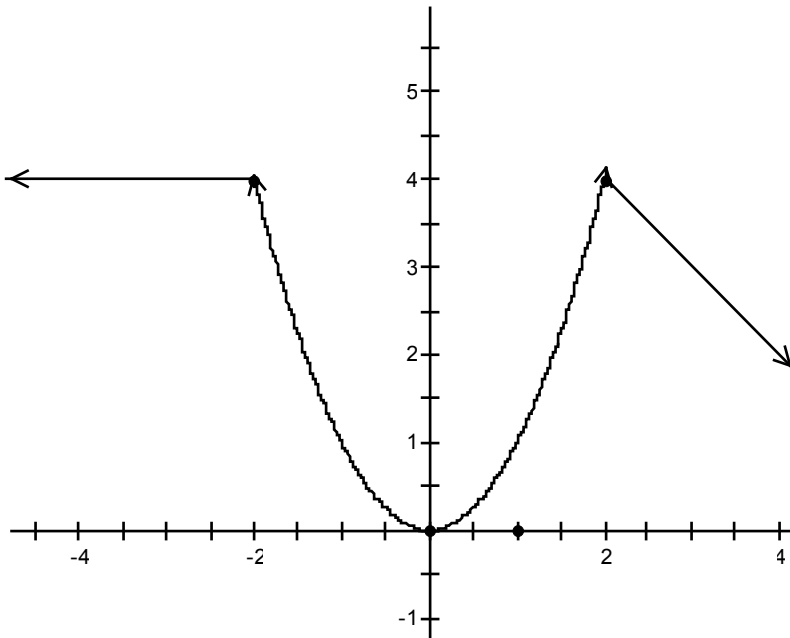
x	$H(x)$
-3	6
-2	4
-1	2
0	0
1	2
2	4

25)



45)

$$f(x) = \begin{cases} 4 & \text{if } x < -2 \\ x^2 & \text{if } -2 \leq x \leq 2 \\ -x+6 & \text{if } x > 2 \end{cases}$$



52)

- a) A Function
b) Not a Function

56)

A function

Domain = $[-3, 2]$

$\{-2\} \cup (0, 3]$

Range = *or*

$\{x \mid x = -2 \text{ or } 0 < x \leq 3\}$

61)

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

$$-4y^2 = -2x + 3$$

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

$$y = \pm \sqrt{\frac{1}{2}x - \frac{3}{4}}$$

Does not define a function

64)

$$\sqrt{y} - x = 5$$

$$\sqrt{y} = x + 5$$

$$y = (x + 5)^2$$

Defines a function