

4.6 Formalizing Relations & Functions

* Review earlier notes on 4.6

- what is a relation? domain? range?
- how can you tell if a table, mapping diagram or graph is a function?

* Function notation -

- equations that are functions can be written in this form

The equation $y = 2x - 1$ is written in terms of "x" & "y." This equation can be written in functional notation, $f(x) = 2x - 1$, where "x" represents the domain & $f(x)$ represents the range.

* $f(x)$ is read as "f of 2", NOT "f times x."

* "g" & "h" can also be used instead of "f"

* Review Problem 3, "Evaluating a Function" on pg. 269

* Got it #3) $w(x) = 250x$
 $w(x) = 250(6)$
 $w(x) = 1500$ words

* Look at next pg. for other function notation

* Review Problem 4 "Finding the Range of a Function" on pg. 270

* Got it #4) $g(x) = 4x - 12$

x	$g(x) = 4x - 12$	$g(x)$
1	$g(x) = 4(1) - 12$	-8
3	$g(x) = 4(3) - 12$	0
5	$g(x) = 4(5) - 12$	8
7	$g(x) = 4(7) - 12$	16

or $\{-8, 0, 8, 16\}$

* Review Problem 5 "Identifying a Reasonable Domain & Range."

* Got it? 5a) $A(q) = 100q$
 $A(q) = 100(7)$
 $A(q) = 700$

Indep = $x =$ quarts
 Dep = $y = A(q)$

domain
 $0 \leq q \leq 7$

range
 $0 \leq A(q) \leq 700$

b) The least amount of paint you can use is 0 quarts. The greatest amount you can use is 3 quarts.

Other Function Notation Examples

* If $f(x) = 2x - 4$ & $g(x) = x^2 - 4x$, find each value for the following

• $f(4)$

$$\begin{aligned}f(x) &= 2x - 4 \\f(4) &= 2(4) - 4 \\f(4) &= 8 - 4 \\f(4) &= 4\end{aligned}$$

• $g(2)$

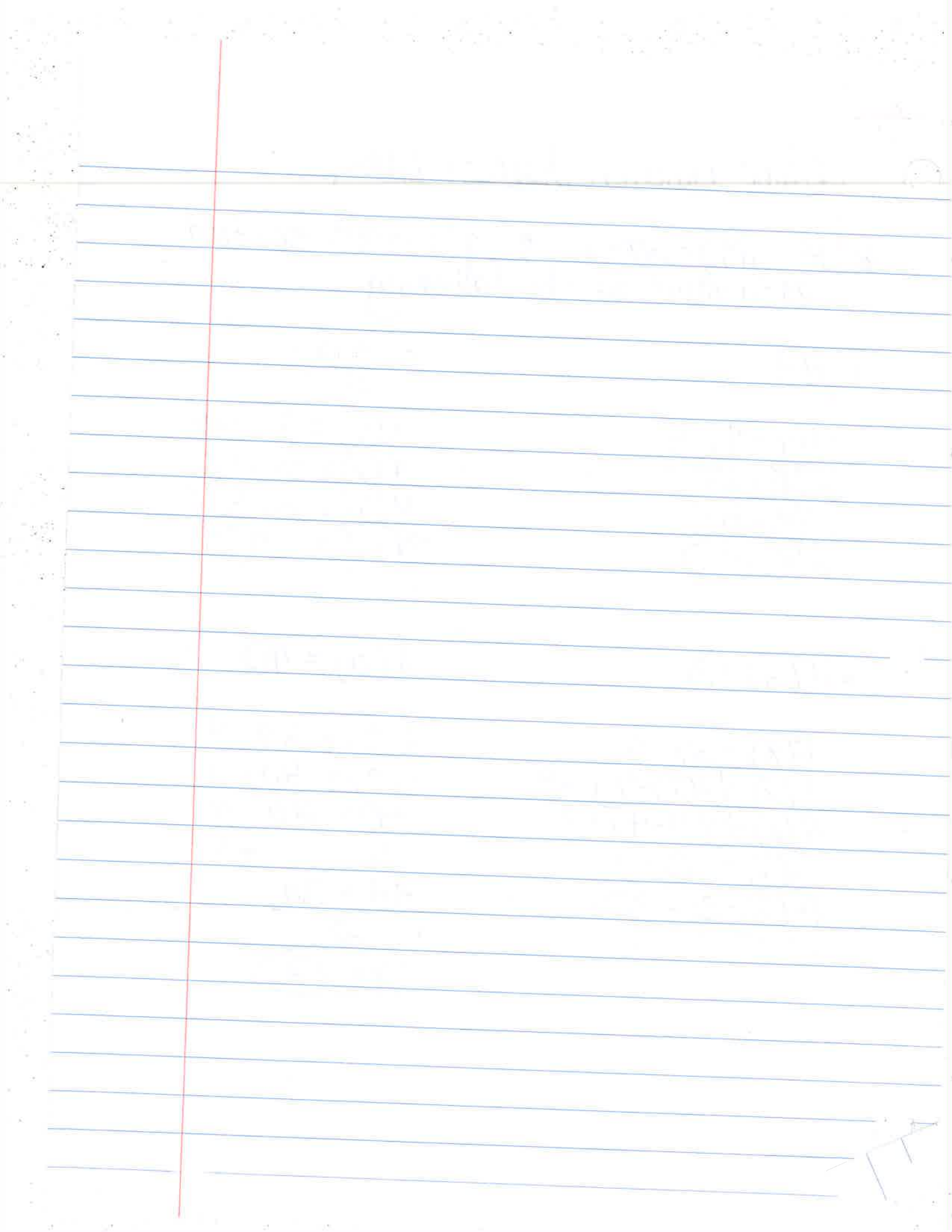
$$\begin{aligned}g(x) &= x^2 - 4x \\g(2) &= 2^2 - 4(2) \\g(2) &= 4 - 8 \\g(2) &= -4\end{aligned}$$

• $f(2) + 3$

$$\begin{aligned}f(x) &= 2x - 4 \\f(2) &= [2(2) - 4] + 3 \\f(2) &= (4 - 4) + 3 \\f(2) &= 0 + 3 \\f(2) + 3 &= 3\end{aligned}$$

$f(a) = 40$

$$\begin{aligned}f(x) &= 2x - 4 \\f(a) &= 2a - 4 \\40 &= 2a - 4 \\+4 & \quad +4 \\44 &= 2a \\2 & \\a &= 22\end{aligned}$$



4.6 pg. 271 #16-18, 20-23, 27, 31-34, 36,
Function Wksht 37-40

16) $d(t) = 186,000t$
 $d(t) = 186,000(30)$
 $= 5,580,000$ miles

27) $d(x) = 32x$
 $d(x) = 32(17)$
 $d(x) = 544$ miles per gallon

17) $f(x) = 4.50x - 7$
 $= 4.50(4) - 7$
 $= \$11$

domain: $0 \leq x \leq 17$
 range: $0 \leq d(x) \leq 544$

18)

x	$f(x) = 2x - 7$	$f'(x)$
-2	$= 2(-2) - 7$	-11
-1	$= 2(-1) - 7$	-9
0	$= 2(0) - 7$	-7
1	$= 2(1) - 7$	-5
2	$= 2(2) - 7$	-3

$f(x) = \{-11, -9, -7, -5, -3\}$

27) $f(x) = 6x - 4$
 $f(a) = 26$
 $f(a) = 6a - 4$
 $26 = 6a - 4$
 $+4 \quad +4$
 $30 = 6a$

20)

x	$h(x) = x^2$	$h(x)$
-1.2	-1.2^2	1.44
0	0^2	0
0.2	0.2^2	0.04
1.2	1.2^2	1.44
4	4^2	16

$h(x) = \{0, 0.04, 1.44, 16\}$

6
 $a = 5$

- 31) Yes
 32) NO
 33) NO
 34) Yes

36) Answers vary - review as a class \Rightarrow

Ex. $\{(1,3), (2,3), (3,3)\}$ is a function,
but its inverse is not.

23) $V(c) = 98c$
 $V(16) = 98(16)$
 $V(16) = 1,568$ cups

domain (cups) $0 \leq c \leq 16$
range (amt. of
Vitamin D in
IUs) $0 \leq V(c) \leq 1568$

x	y
0	0
8	784
16	1568

* If you need 3 ordered
pairs, what makes
sense as another
"x" value? $\frac{16-0}{2} = 8$

19) $\{-39, -7, 1, 5, 21\}$

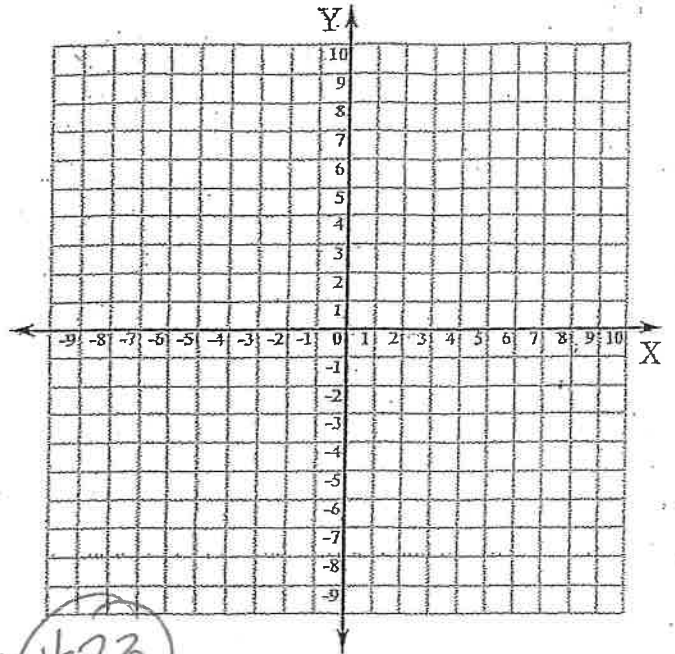
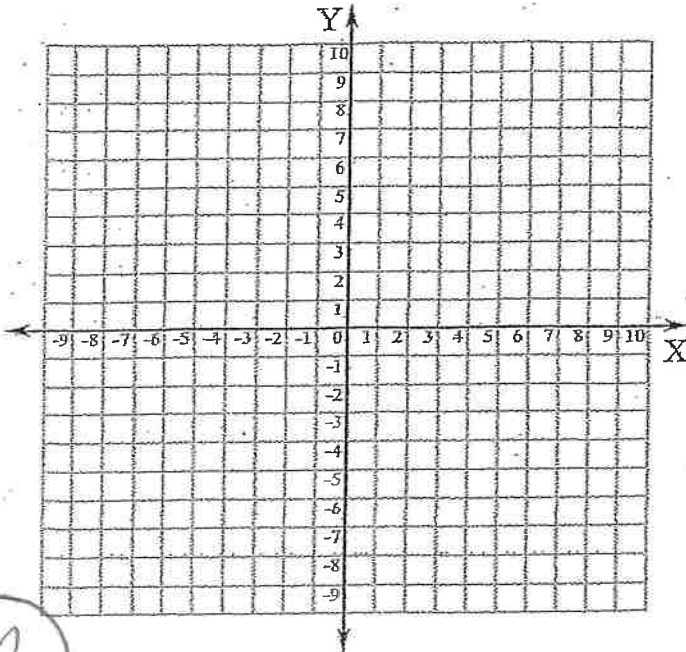
21) $\{-7, -2, -1, 3\}$

37) 23

38) 18

39) 6

40) 20



#22

#23

$d(x) = 32x$ (17, 544) Max.

$V(c) = 98c$ (16, 1568) Max.

