

Functions

Determine the domain and the range of each relation described below. Determine whether the relation is a function.

1.
 X Domain $\{-3, -2, 1\}$
 Y Range $\{-2, -1, 2\}$

2.

Domain _____
 Range _____

3.
 Domain $(-\infty, \infty)$
 Range $\{-2, 2\}$
 $(-3, 3)$

4.
 Domain $(-\infty, \infty)$
 Range $(-\infty, \infty)$

5.
 Domain $[-2, \infty)$
 Range $[-2, \infty)$

6.
 Domain $[-3, 4]$
 Range $[-2, 3]$
 $-3 \leq x \leq 4$
 (Handwritten notes: 'small' and 'big' with arrows pointing to the y and x ranges respectively.)

7.
 Domain $[3]$
 Range $(-\infty, \infty)$

8.
 Domain $[-2, 6]$
 Range $[2]$
 $-2 \leq x \leq 6$

9.
 Domain $(-\infty, \infty)$
 Range $(-\infty, \infty)$

10.
 Domain _____
 Range _____

11.
 Domain $(-\infty, \infty)$
 Range $[-2, \infty)$
 $y \geq -2$
 (Handwritten note: 'Law' with arrows pointing to the domain and range.)

12.
 Domain $(-\infty, \infty)$
 Range $(-\infty, 2]$
 all real #'s
 $y \leq 2$
 (Handwritten note: 'High' with an arrow pointing to the range.)

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Day 62

GRAPHING ABSOLUTE VALUE FUNCTIONS

Standard Form : $Y = a|x-h| + K$

Reflection:

The a value will decide if a reflection is present.

If a is positive, the v-shaped graph will open up

$$y = |x-3| + 2 \quad (a=1)$$

$$y = 2|x+1| \quad (a=2)$$

If a is negative, the v-shaped graph will open down.
(This is a reflection.)

$$y = -|x-3| + 2 \quad (a=-1)$$

The vertex is at (h, k) .

⊗ $y = |x-3| + 2$

vertex: $(3, 2)$

right 3, up 2

⊗ $y = |x+4| - 1$

vertex: $(-4, -1)$

left 4 down 1

$$x+4=0$$

$$-4 \quad -4$$

$$x = -4$$

⊗ $y = |x+1| + 7$
 $|x-1|$

vertex $(-1, 7)$

left 1, down 7

⊗ $y = 5 - |x-1|$

vertex: $(1, 5)$

$a = -1$ reflection

Horizontal Shift

vs.

Vertical Shift

A Hor. shift, along the X-axis

A Vertical shift, along the Y-axis

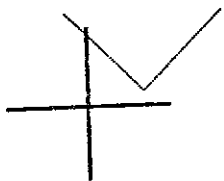
_____ of the absolute value bars look like this

$$y = |x - h|$$

If the K value is positive the absolute value graph will move up the origin K units.

$$y = |x| + K$$

the absolute value graph will be shifted to the right of the origin h units



(ex) $y = |x| + 3$ move up 3

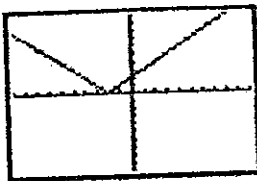
If the inside of the absolute value bars look like this

$$y = |x + h| \text{ or}$$

If the K value is negative the absolute value graph will move down the origin K units.

$$y = |x| - K$$

the absolute value graph will be shifted to the left of the origin h units

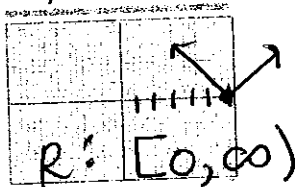


Examples:

Examples:

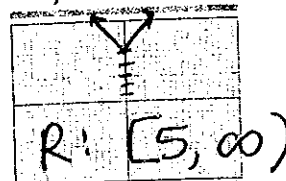
right
6

1.) $|x - 6|$



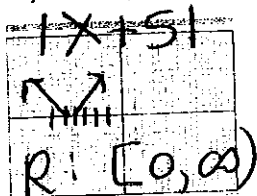
up 5

1.) $|x| + 5$



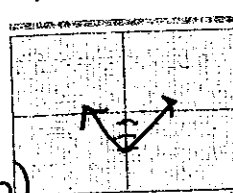
left
5

2.) $|x - (-5)|$



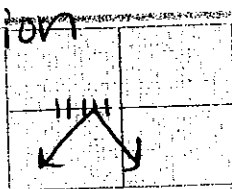
down
3

2.) $|x| - 3$



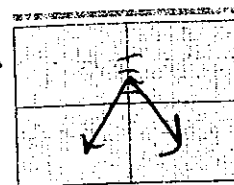
reflection
left
2

3.) $|x + 2|$

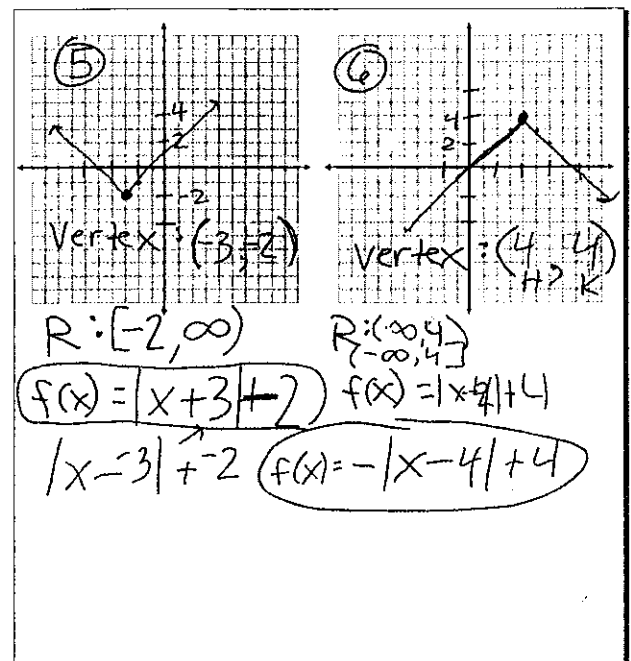
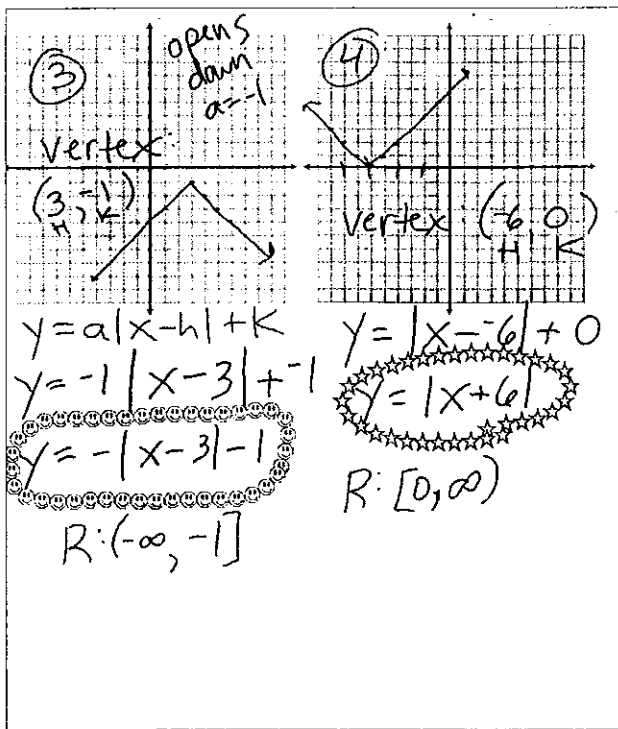
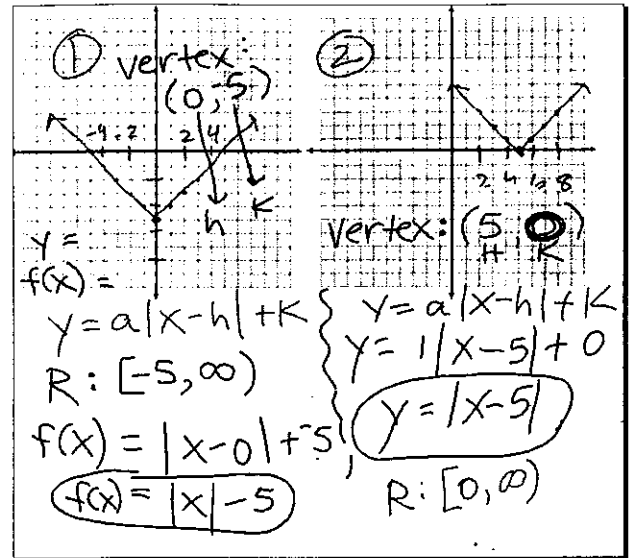


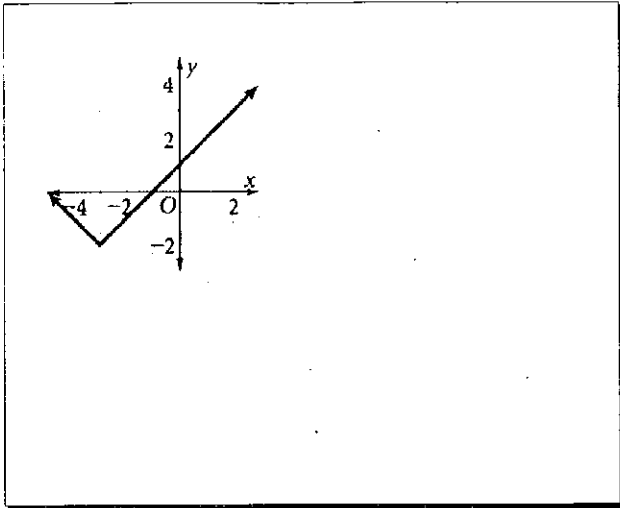
reflect.
up 2

3.) $|x| + 2$



W-UPS: Day 62
 Domain / Range
 WKST





Write an equation for each translation of $y = |x|$.

10. 9 units up 11. 6 units down 12. 0.25 units up

$y = |x| + 9$ $y = |x| - 6$

13. $\frac{5}{2}$ units up 14. 5.90 units up 15. 1 unit down

$y = |x| + 5.90$ $y = |x| - 1$

21. left 9 units 23. right 9 units 24. right $\frac{5}{3}$ units

$y = |x + 9|$ $y = |x - 9|$

$|x - 9|$

25. left $\frac{3}{2}$ units, down 2

$y = |x + \frac{3}{2}| - 2$

Write an equation for each translation of $y = -|x|$.

32. 2 units up 33. 2.25 units left, down 6

$y = -|x| + 2$ $y = -|x + 2.25| - 6$

Hw: wk bk
P. 359
(2-38E, 40-43)

37. $y = |x - 1| + 2$ 38. $y = |x + 2| - 1$