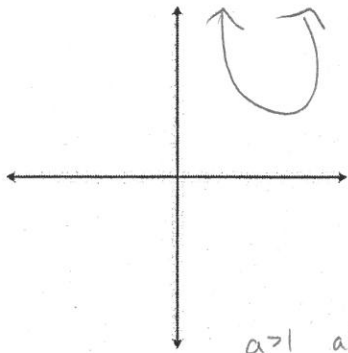


Unit 2 (3.3a)

Transformations

$$y = a(x - h)^2 + k$$

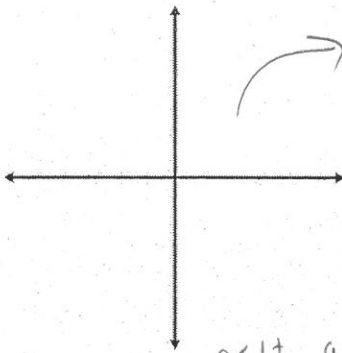


a: R if - D U U $a > 1$ $a < 1$

h: HT \leftrightarrow (opp)

k: VT \updownarrow

$$y = a\sqrt{x - h} + k$$

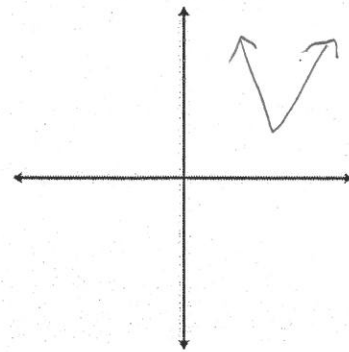


a: " D U U $a < 1$ $a > 1$

h: "

k: "

$$y = a|x - h| + k$$



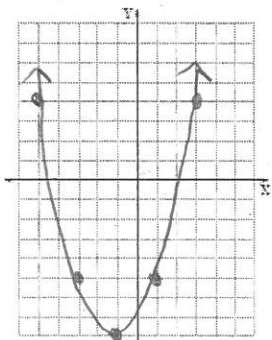
a: " D is slope

h: "

k: "

Quadratic

Graph: $y = \frac{3}{4}(x + 1)^2 - 8$



Domain: $(-\infty, \infty)$

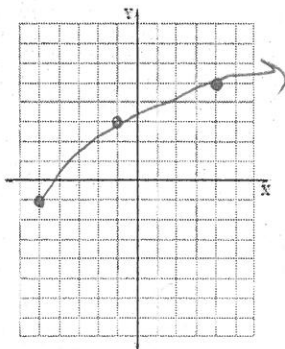
Range: $[-8, \infty)$

Transformations:

$D^{3/4}$ HT -1 VT -8

Radical

Graph: $y = 2\sqrt{x + 5} - 1$



Domain: $[-5, \infty)$

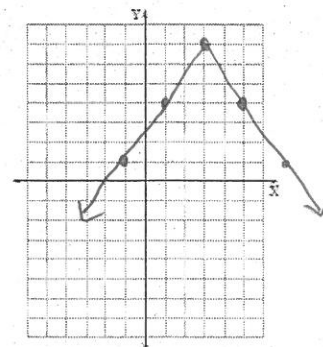
Range: $[-1, \infty)$

Transformations:

D2 HT -5 VT -1

Absolute Value

Graph: $y = -\frac{3}{2}|x - 3| + 7$



Domain: $(-\infty, \infty)$

Range: $(-\infty, 7]$

Transformations:

R $D^{3/2}$ HT 3 VT 7

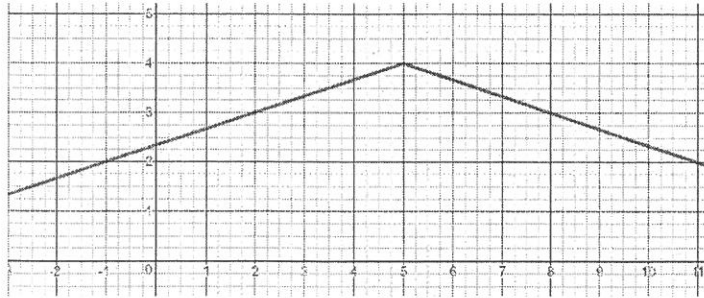
Practice With Transformations

Given the equation, describe the transformations.

Equation	Transformation
1. $y = \sqrt{x-2} + 5$	HT 2, VT 5
2. $y = - x-7 + 9$	R, HT 7, VT 9
3. $y = 5(x-9)^2 + 3$	D 5, HT 9, VT 3
4. $y = \frac{1}{2} x+10 - 8$	D $\frac{1}{2}$, HT -10, VT -8
5. $y = -3\sqrt{x-1} + 11$	R, D 3, HT 1, VT 11
6. $y = -\frac{2}{3}(x+8)^2 - 12$	R, D $\frac{2}{3}$, HT -8, VT -12
7. $y = -6 x+1 $ $-6 x+1 + 0$	R, D 6, HT -1
8. $y = \frac{1}{4}\sqrt{x} - 6$ $\frac{1}{4}\sqrt{x-0} - 6$	D $\frac{1}{4}$, VT -6

Given the graph, write the equation and describe the transformations.

9.



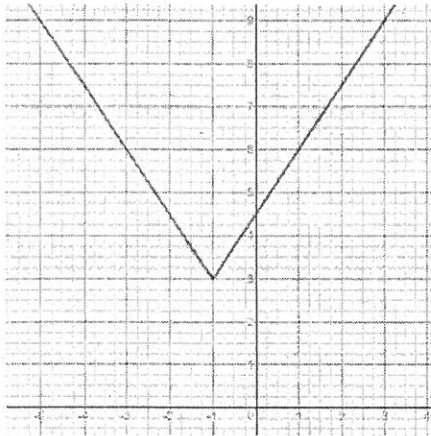
Equation:

$$y = -\frac{1}{3}|x-5| + 4$$

Transformations:

$$R, D\frac{1}{3}, HT\ 5, VT\ 4$$

10.



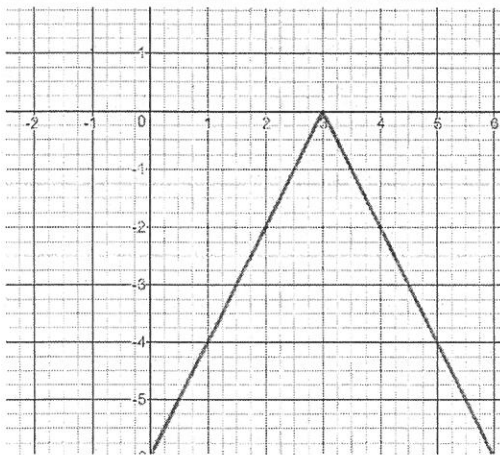
Equation:

$$y = \frac{3}{2}|x+1| + 3$$

Transformations:

$$D\frac{3}{2}, HT\ -1, VT\ 3$$

11.



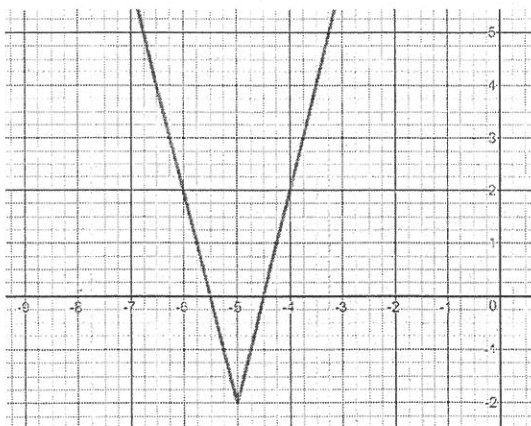
Equation:

$$y = -2|x-3| + 0$$

Transformations: or $y = -2|x+3|$

$$R, D2, HT\ 3$$

12.



Equation:

$$y = 4|x+5| - 2$$

Transformations:

$$D\ 4, HT\ -5, VT\ -2$$

Given the transformations, write the equation.

<p>13. Quadratic Horizontal Translation (HT): 4 Vertical Dilation (VD): 8 Vertical Translation (VT): -2</p> <p>Equation: $y = 8(x-4)^2 - 2$</p>	<p>14. Radical Vertical Translation (VT): 5 Horizontal Translation (HT): -2</p> <p>Equation: $y = \sqrt{x+2} + 5$</p>
<p>15. Absolute Value Vertical Dilation (VD): -3 Vertical Translation (VT): 4</p> <p>Equation: $y = -3 x-0 + 4$ or $y = -3 x + 4$</p>	<p>16. Radical Horizontal Translation (HT): 9 Vertical Translation (VT): -14 Vertical Dilation (VD): -1/2</p> <p>Equation: $y = -\frac{1}{2}\sqrt{x-9} - 14$</p>
<p>17. Quadratic Horizontal Translation (HT): -15 Vertical Dilation (VD): 5/6</p> <p>Equation: $y = \frac{5}{6}(x+15)^2 + 0$ or $y = \frac{5}{6}(x+15)^2$</p>	<p>18. Absolute Value Vertical Translation (VT): 1 Horizontal Translation (HT): 10 Vertical Dilation (VD): 1/5</p> <p>Equation: $y = \frac{1}{5} x-10 + 1$</p>
<p>19. Radical Vertical Dilation (VD): -4 Vertical Translation (VT): 2 Horizontal Translation (HT): 1</p> <p>Equation: $y = -4\sqrt{x-1} + 2$</p>	<p>20. Quadratic Horizontal Translation (HT): -17 Vertical Translation (VT): -41</p> <p>Equation: $y = (x+17)^2 - 41$</p>