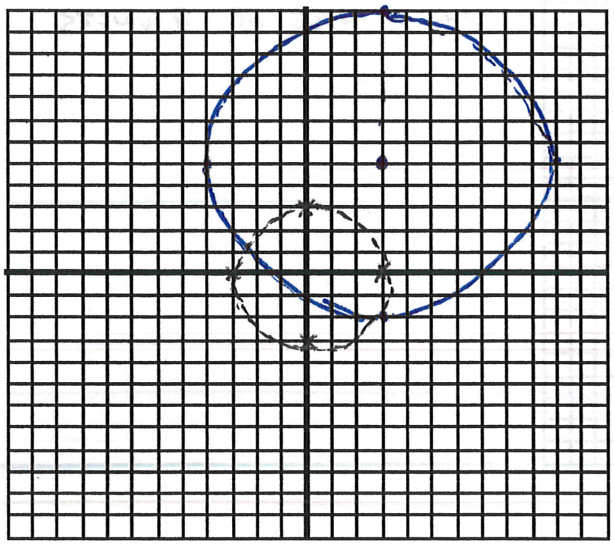
Review For Chapter 3 Test

Name KEY

Use the **parent graph** to describe each function.

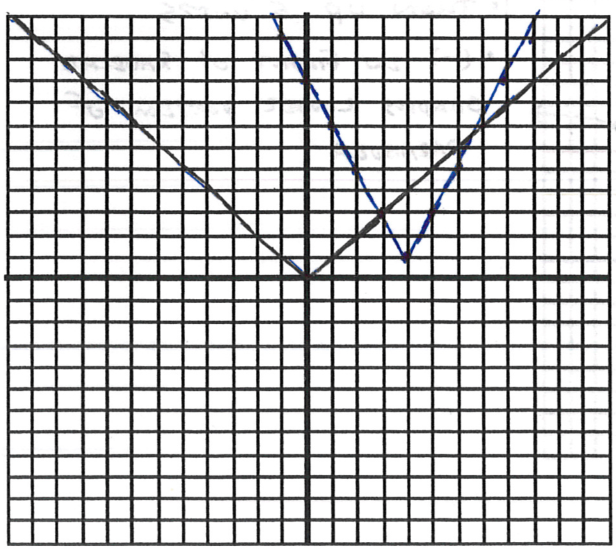
1. $F(x,y):\ x^2 + y^2 = 9$
$f(x,y):\ (x-3)^2 + (y-5)^2 = 49$



DESCRIPTION OF CHANGE

- SHIFT RIGHT 3 UNITS
- THEN SHIFT UP 5 UNITS
- RADIUS WILL INCREASE FROM 3 UNITS TO 7 UNITS

2. $G(X) = |x|$
$g(x) = 2|\ (x-4)| + 1$

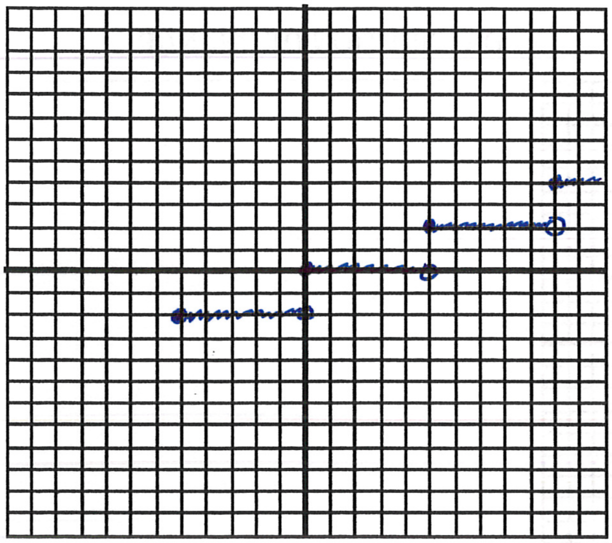


DESCRIPTION OF CHANGE

- SHIFT RIGHT 4 UNITS
- THEN SHIFT UP 1 UNIT
- OPENING CHANGES FROM Slope of ± 1 To Slope ± 2

3. $H(x) = \lfloor x \rfloor$

$h(x) = 2\left\lfloor \frac{1}{5}x \right\rfloor$

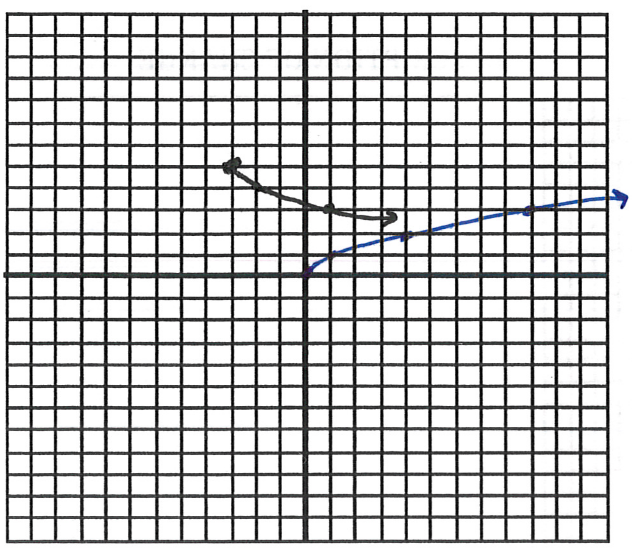


DESCRIPTION OF CHANGE

- CHANGES TO TREAD OF 5 UNITS
- RISES BY UNIT OF TWO
- CLOSED CIRCLE AT ORIGIN (OPEN ENDED ON RIGHT)

4. $Q(x) = \sqrt{x}$

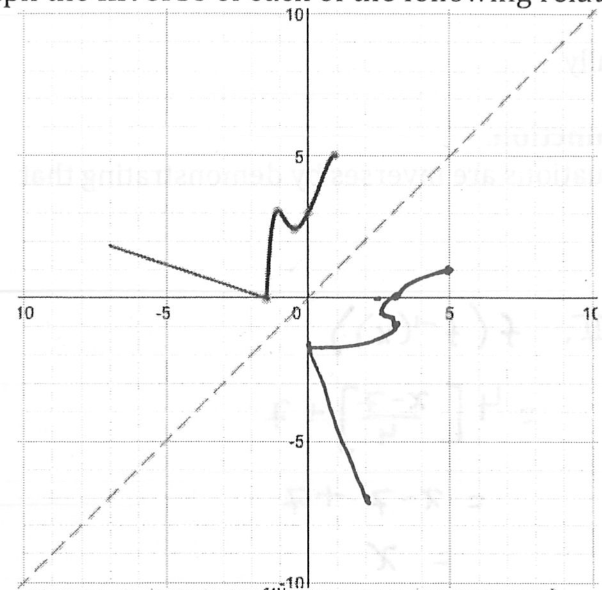
$q(x) = -\sqrt{x+3} + 5$

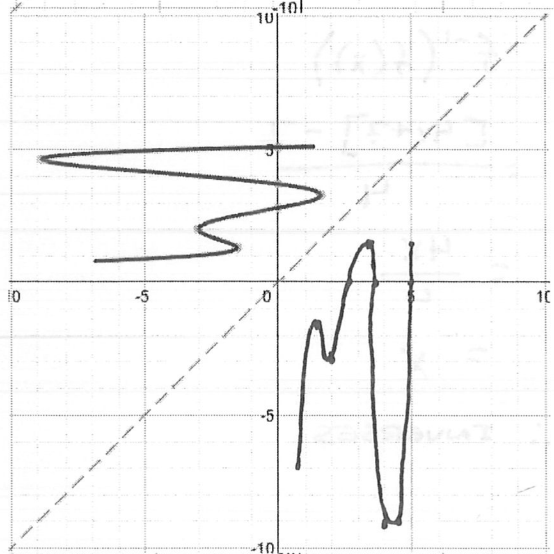


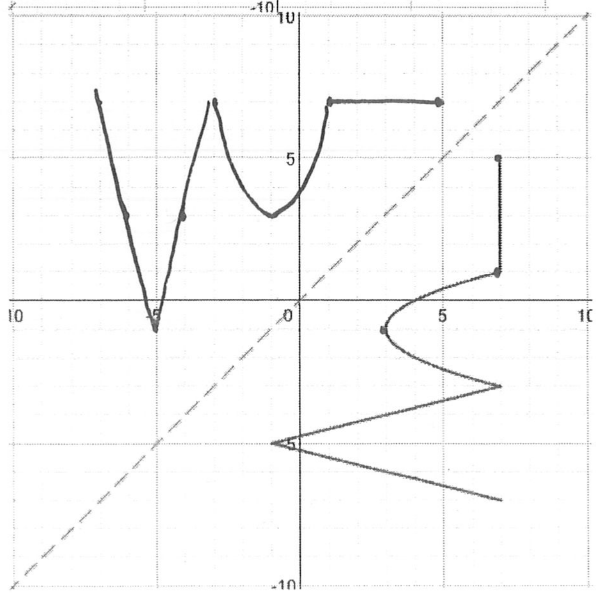
DESCRIPTION OF CHANGE

- SHIFTS THREE UNITS TO LEFT, THEN UP FIVE UNITS
- (−) IN FRONT OF RADICAL GRAPHS LOWER PORTION OF PARABOLA
- STILL MOVES OFF TO RIGHT

A. Graph the **inverse** of each of the following relations.







B. Analyze Inverses Mathematically

I) Find the **inverse** of the **given function**.
II) Then **show** that indeed the equations are inverses by demonstrating that

$$f\left(f^{-1}(x)\right) = f^{-1}(f(x))$$

1. $y = 4x + 7$

I. $f(x) = 4x + 7$

$f^{-1}(x)$: $x = 4y + 7$

$x - 7 = 4y$

$f^{-1}(x)$: $\frac{x-7}{4} = y$

II. $f(f^{-1}(x))$

$= 4\left[\frac{x-7}{4}\right] + 7$

$= x - 7 + 7$

$= x$

$f^{-1}(f(x))$

$= \frac{[4x+7] - 7}{4}$

$= \frac{4x}{4}$

$= x$

$\therefore$ INVERSES

I) Find the **inverse** of the **given function.**
II) Then **show** that indeed the equations are inverses by demonstrating that
$f(f^{-1}(x)) = f^{-1}(f(x))$

2. $y = x^2 - 8x + 5$

I. $f(x) = x^2 - 8x + 5$

$f^{-1}(x)$: $x = y^2 - 8y + 5$

$x = y^2 - 8y + 16 + 5 - 16$

$x = (y-4)^2 - 11$

$x + 11 = (y-4)^2$

$(x+11)^{1/2} = y - 4$

$f^{-1}(x)$: $(x+11)^{1/2} + 4 = y$

II $f(f^{-1}(x))$

$[(x+11)^{1/2}+4]^2 - 8[(x+11)^{1/2}+4] + 5$

$x+11 + 8(x+11)^{1/2} + 16 - 8(x+11)^{1/2} - 32 + 5$

$x + 11 - 16 + 5$

$x - 5 + 5$

x

$f^{-1}(f(x))$

$([x^2 - 8x + 5] + 11)^{1/2} + 4$

$(x^2 - 8x + 16)^{1/2} + 4$

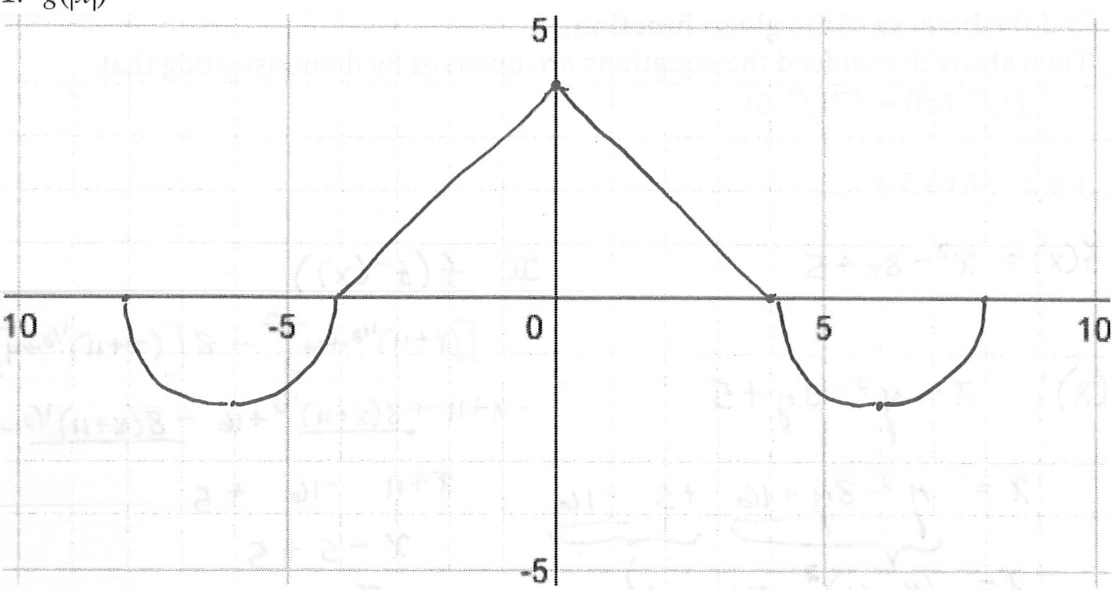
$[(x-4)^2]^{1/2} + 4$

$x - 4 + 4$

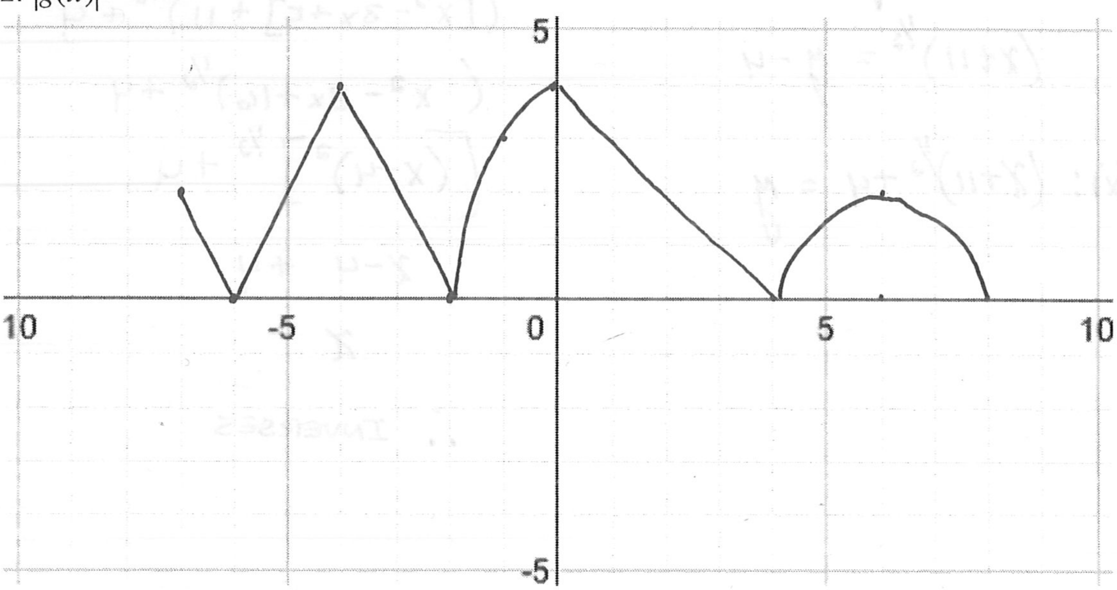
x

∴ INVERSES

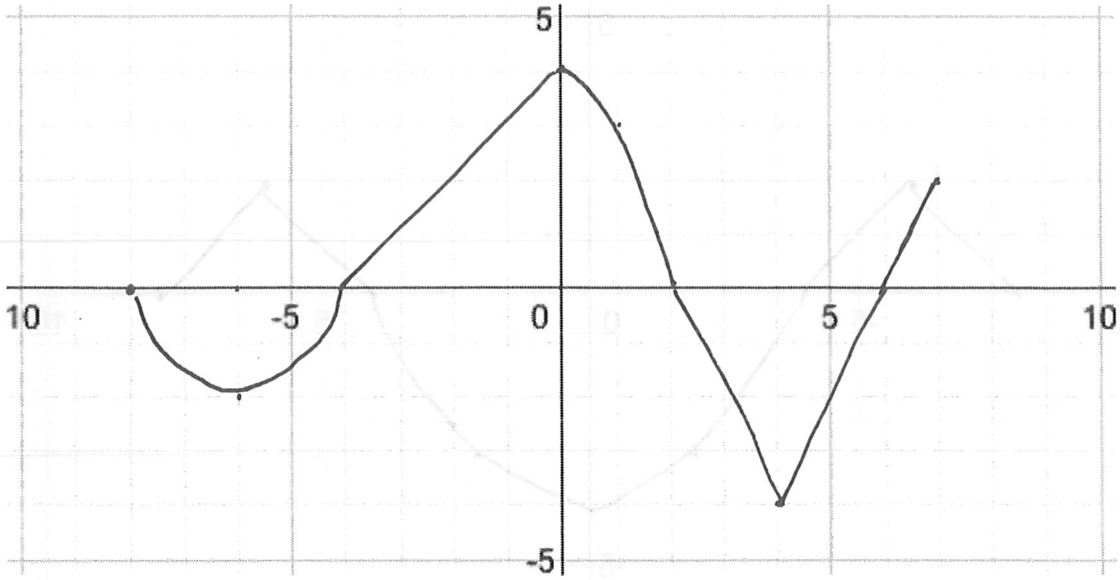
1. $g(|x|)$



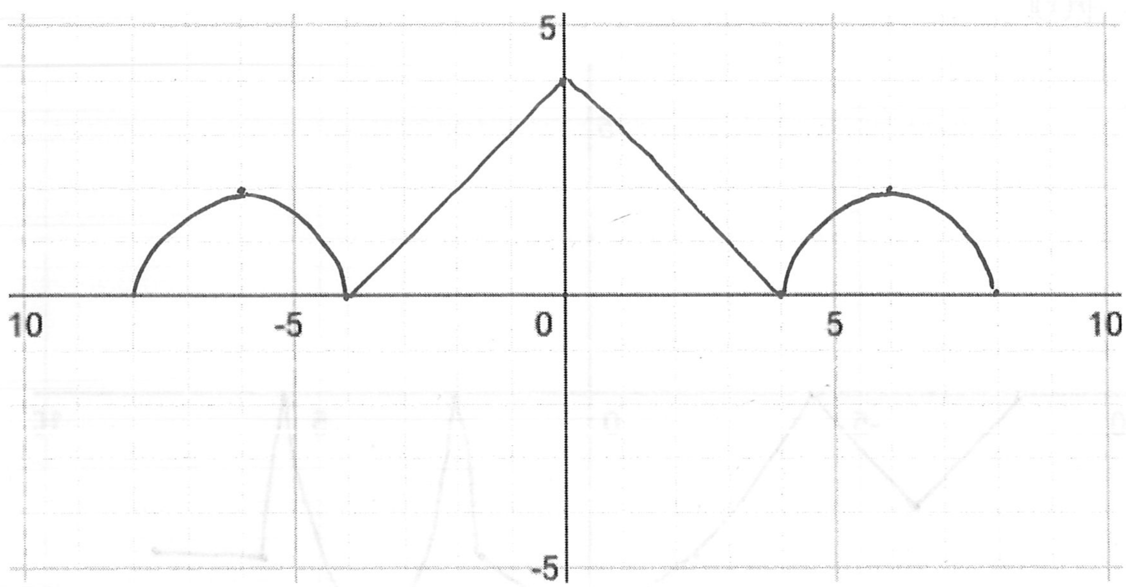
2. $|g(x)|$



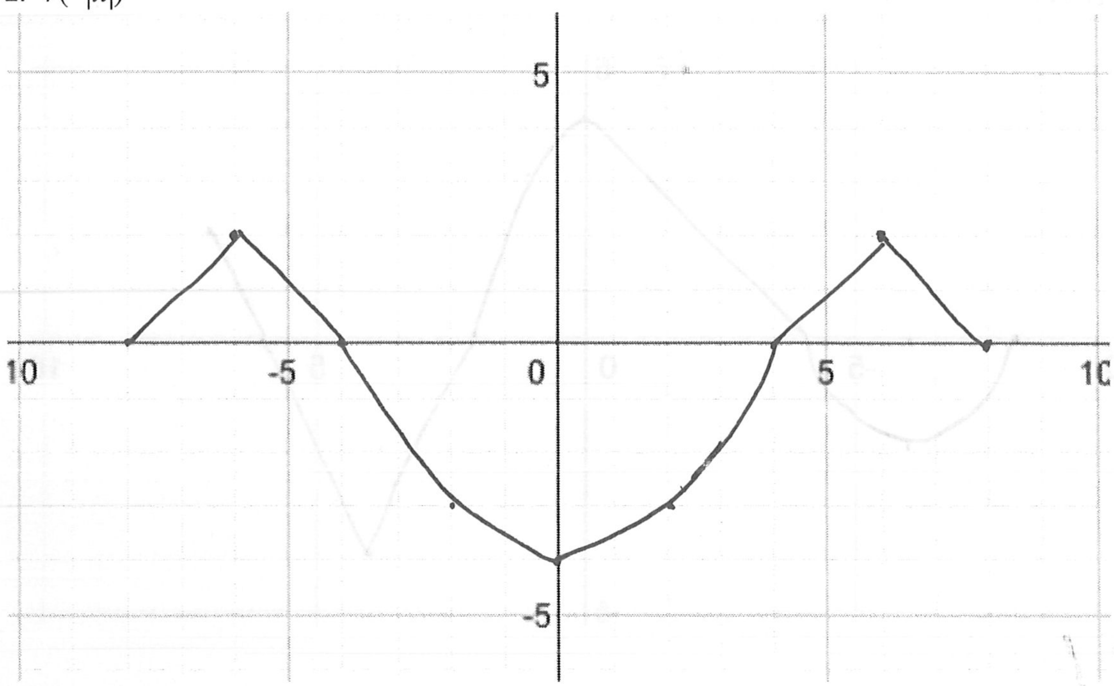
3. $g(-x)$



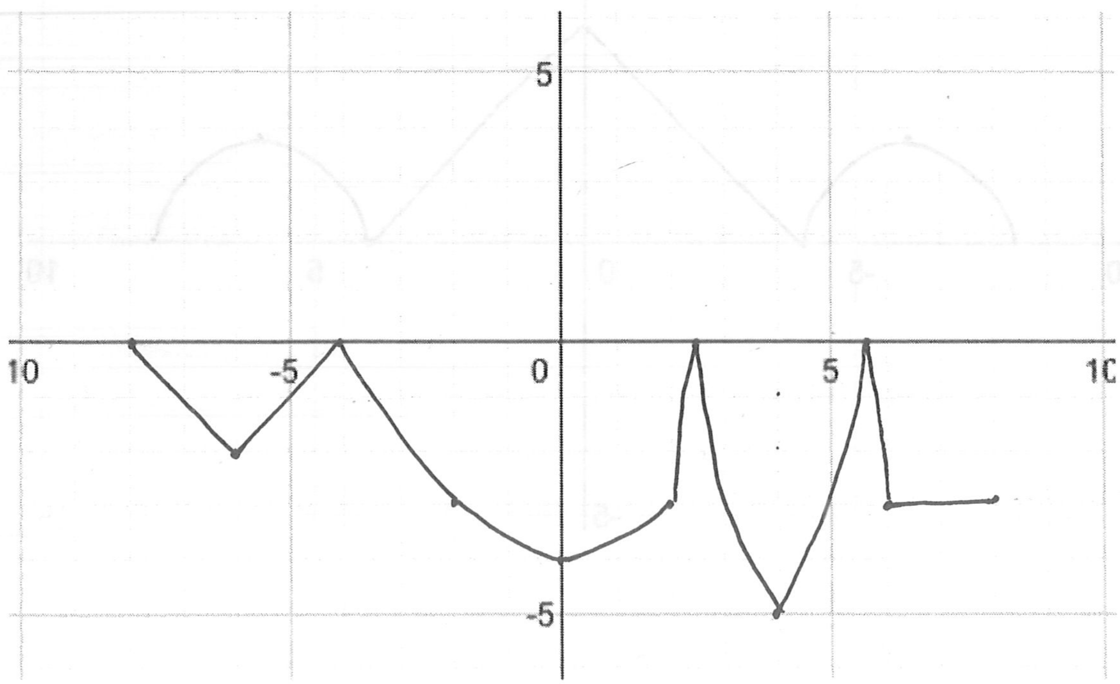
4. $|g(|x|)|$



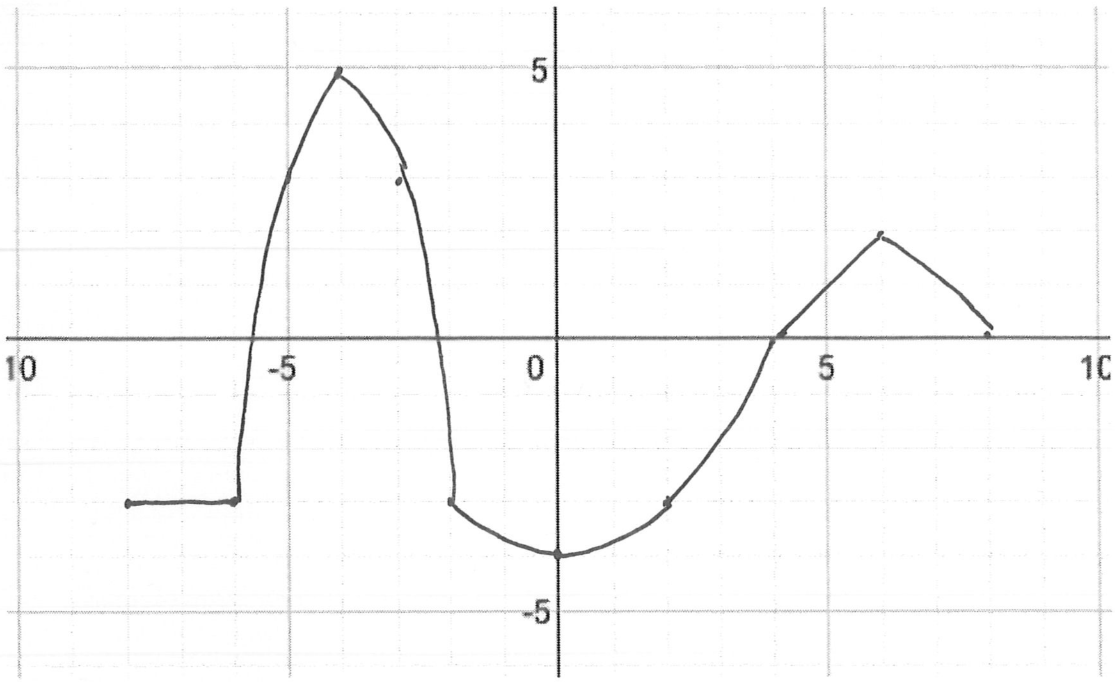
1. $r(-|x|)$



2. $-|r(x)|$



3. $r(-x)$



4. $-|r(-|x|)|$