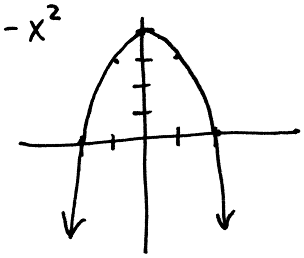
Section 1.2 : 5-49 odd, 51-55 odd, 65-70 all, 72

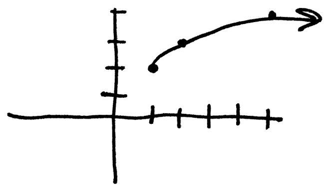
5. $y = 4 - x^2$



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

R: $(-\infty, 4]$

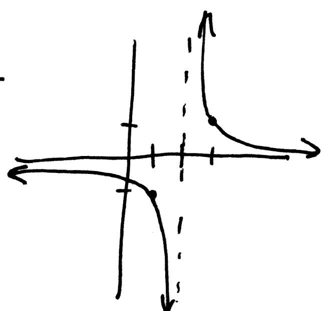
7. $y = \sqrt{x-1} + 2$



D: $[1, \infty)$

R: $[2, \infty)$

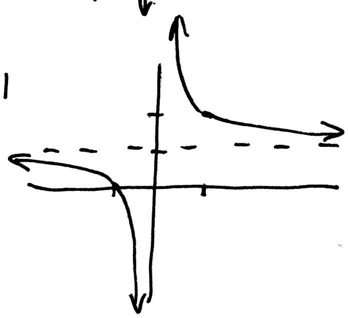
9. $y = \frac{1}{x-2}$



D: $(-\infty, 2) \cup (2, \infty)$

R: $(-\infty, 0) \cup (0, \infty)$

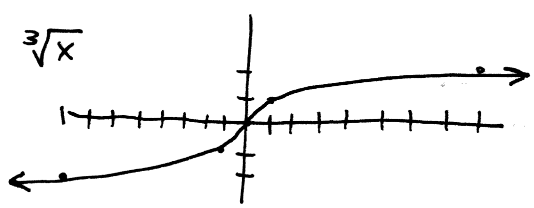
11. $y = \frac{1}{x} + 1$



D: $(-\infty, 0) \cup (0, \infty)$

R: $(-\infty, 1) \cup (1, \infty)$

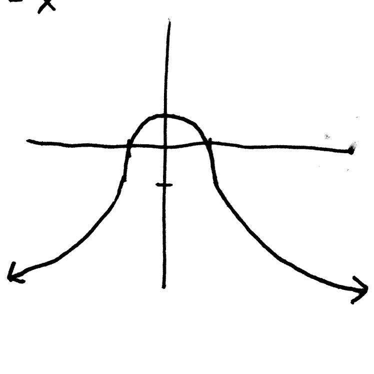
13. $y = \sqrt[3]{x}$



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

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

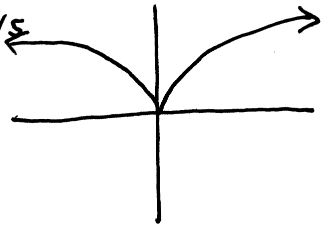
15. $y = \sqrt[3]{1 - x^2}$



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

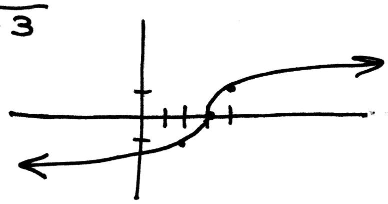
R: $(-\infty, 1]$

17. $y = x^{2/5}$



D: $(-\infty, \infty)$
R: $[0, \infty)$

19. $y = \sqrt[3]{x-3}$



D: $(-\infty, \infty)$
R: $(-\infty, \infty)$

21. Even $\quad (-x)^4 = x^4$

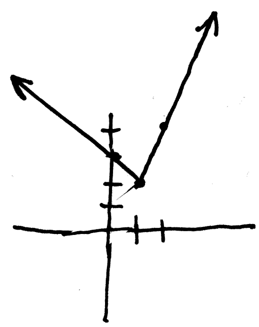
23. Neither $\quad -x+2$

25. $\sqrt{(-x)^2+2} = \sqrt{x^2+2} \rightarrow$ Even

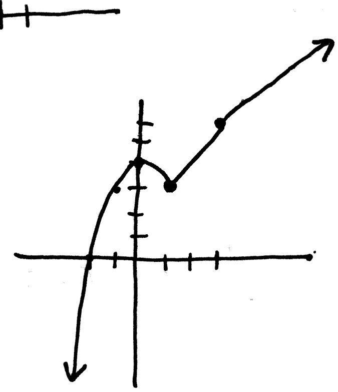
27. $\dfrac{(-x)^3}{(-x)^2-1} = \dfrac{-x^3}{x^2-1} = -\dfrac{x^3}{x^2-1} \rightarrow$ Odd

29. $\dfrac{1}{-x-1} \rightarrow$ Neither

31. $f(x) = \begin{cases} -x+3, & x \le 1 \\ 2x, & x > 1 \end{cases}$



33. $f(x) = \begin{cases} 4-x^2, & x < 1 \\ 3/2\,x + 3/2, & 1 \le x \le 3 \\ x+3, & x > 3 \end{cases}$



35. Each x value has only one y value, which is the definition of a function.

37. No

39. Yes

41. $f(x) = \begin{cases} x, & 0 \le x \le 1 \\ -x+2, & 1 \le x \le 2 \end{cases}$

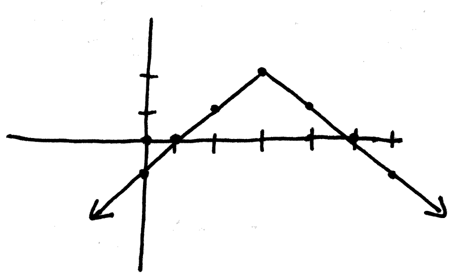
43. $f(x) = \begin{cases} -x+2, & 0 < x \le 2 \\ -\frac{1}{3}x + \frac{5}{3}, & 2 < x \le 5 \end{cases}$

45. $f(x) = \begin{cases} -x, & -1 \le x < 0 \\ 1, & 0 < x \le 1 \\ -\frac{1}{2}x + \frac{3}{2}, & 1 \le x < 3 \end{cases}$

47. $f(x) = \begin{cases} 0, & 0 \le x \le T/2 \\ \frac{2}{T}x - 1, & \frac{T}{2} \le x \le T \end{cases}$ $\quad m = \frac{\Delta y}{\Delta x} = \frac{1}{\frac{1}{2}T} = \frac{2}{T}$

49. $f(x) = -|3-x| + 2$

| x | y |
|---|---|
| 1 | 0 |
| 2 | 1 |
| 3 | 2 |
| 4 | 1 |
| 5 | 0 |



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

R: $(-\infty, 2]$

51. $f(x) = x+5$, $g(x) = x^2 - 3$

a) $f(g(x)) = x^2 - 3 + 5 = x^2 + 2$

b) $g(f(x)) = (x+5)^2 - 3 = x^2 + 10x + 25 - 3 = x^2 + 10x + 22$

c) $f(g(0)) = f(-3) = 2$

d) $g(f(0)) = g(5) = 5^2 - 3 = 22$

e) $g(g(-2)) = g(1) = 1^2 - 3 = -2$

f) $f(f(x)) = x + 5 + 5 = x + 10$

53. a) $x^2$

b) $1 + \frac{1}{a} = x$

$\frac{1}{a} = \frac{x-1}{1} \rightarrow a = \frac{1}{x-1}$

c) $\frac{1}{x}$ bc $\frac{1}{(1/x)} = \frac{x}{1} = x$ ✓

d) $x^2$ bc $(\sqrt{x})^2 = x$ ✓

55. a) $C = 2\pi r - \underset{\substack{\uparrow \\ \text{cut out}}}{x} = 2\pi(4) - x = 8\pi - x$

b) $C = 2\pi r$

$8\pi - x = 2\pi r \rightarrow r = \dfrac{8\pi - x}{2\pi} = 4 - \dfrac{x}{2\pi}$

c) $r^2 + h^2 = 4^2 \rightarrow h = \sqrt{16 - r^2}$

$$r^2 = \left(\frac{8\pi - x}{2\pi}\right)^2 = \frac{(8\pi - x)^2}{4\pi^2} = \frac{64\pi^2 - 16\pi x + x^2}{4\pi^2}$$

$$h = \sqrt{\frac{16}{1} - r^2} = \sqrt{\frac{\cancel{64\pi^2} - \cancel{64\pi^2} + 16\pi x - x^2}{4\pi^2}} = \frac{\sqrt{16\pi x - x^2}}{2\pi}$$

d) $$V = \frac{1}{3}\pi r^2 h = \frac{\cancel{\pi}}{3} \cdot \frac{(8\pi - x)^2}{4\pi^2} \cdot \frac{\sqrt{16\pi x - x^2}}{2\cancel{\pi}} = \frac{(8\pi - x)^2\sqrt{16\pi x - x^2}}{24\pi^2}$$

65. $f(x) = x^2 - 3,\ g(x) = \sqrt{x+2}$

b) $f \circ g = \sqrt{x+2}^{\,2} - 3 = x + 2 - 3 = x - 1$ with $x \geq -2$

$g \circ f = \sqrt{x^2 - 3 + 2} = \sqrt{x^2 - 1}$

a) D: $[-2, \infty)$, R: $[-3, \infty)$ $f \circ g$

D: $(-\infty, -1] \cup [1, \infty)$, R: $[0, \infty)$ $g \circ f$

66. $f(x) = \dfrac{2x - 1}{x + 3}$, $g(x) = \dfrac{3x + 1}{2 - x}$

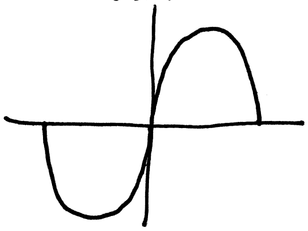
b) $$f \circ g = \frac{2\left(\frac{3x+1}{2-x}\right) - 1}{\frac{3x+1}{2-x} + 3} = \frac{\frac{6x+2}{2-x} - \frac{2-x}{2-x}}{\frac{3x+1}{2-x} + \frac{6-3x}{2-x}} = \frac{\frac{6x + \cancel{2} - \cancel{2} + x}{2-x}}{\frac{\cancel{3x} + 1 + 6 - \cancel{3x}}{2-x}} = \frac{\frac{7x}{2-x}}{\frac{7}{2-x}} = \frac{\cancel{7}x}{\cancel{2-x}} \cdot \frac{\cancel{2-x}}{\cancel{7}} = x$$ with $x \neq$

$$g \circ f = \frac{3\left(\frac{2x-1}{x+3}\right) + 1}{2 - \frac{2x-1}{x+3}} = \frac{\frac{6x - \cancel{3}}{x+3} + \frac{x + \cancel{3}}{x+3}}{\frac{\cancel{2x} + 6}{x+3} - \frac{\cancel{2x} - 1}{x+3}} = \frac{\frac{7x}{x+3}}{\frac{7}{x+3}} = \frac{\cancel{7}x}{\cancel{x+3}} \cdot \frac{\cancel{x+3}}{\cancel{7}} = x \text{ with } x \neq -3$$

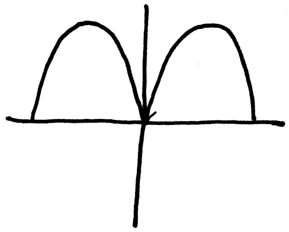
a) $f \circ g$ : D: $(-\infty, 2) \cup (2, \infty)$, R: $(-\infty, 2) \cup (2, \infty)$

$g \circ f$: D: $(-\infty, -3) \cup (-3, \infty)$, R: $(-\infty, -3) \cup (-3, \infty)$

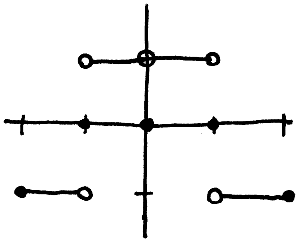
67. Odd



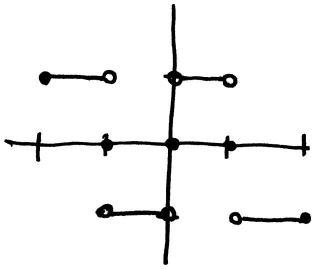
Even



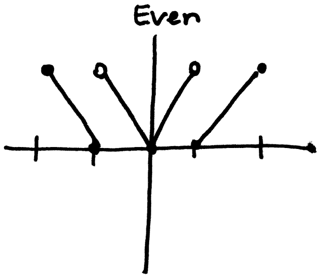
68. Even



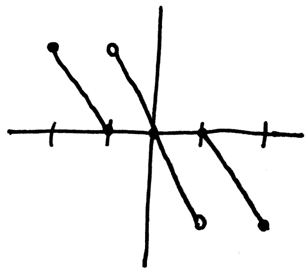
Odd



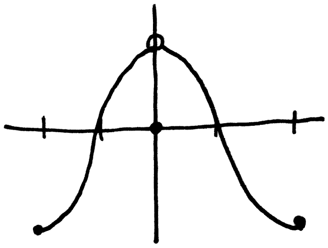
69. Even



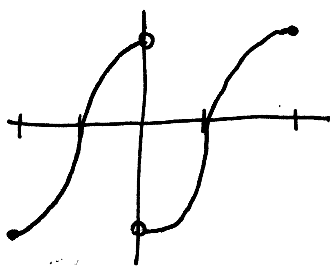
Odd



70. Even



Odd



72. a) Even: $f(-x) = f(x)$

$f(-x) \cdot g(-x) = f(x) \cdot g(x) = f \cdot g\,(x)$

Still even bc substituting $-x$ still produced the same result.

b) Odd: $f(-x) = -f(x)$

$f(-x) \cdot g(-x) = -f(x) \cdot -g(x) = f(x) \cdot g(x) = f \cdot g\,(x)$

Becomes even bc two negatives cancel and the result is positive.

Secondary Math 2 Name________________

# 5-1: Solving Equations Notes

Ignore this page.

Date________ Period____

**Solve each equation.**

1) $a - 4 = -2$

2) $\frac{n}{3} = -4$

3) $72 = -6n + 6$

4) $9 = \frac{10 + n}{3}$

**Solve each proportion.**

5) $\frac{8}{10} = \frac{5}{x}$

**Solve each equation.**

6) $8m + 1 + 8m = -15$

7) $4(-6a + 1) = -164$

8) $8 - p = -7 + 2p$

**Solve each equation for the indicated variable.**

9) $u = a + k$, for $a$

10) $u = kx$, for $x$