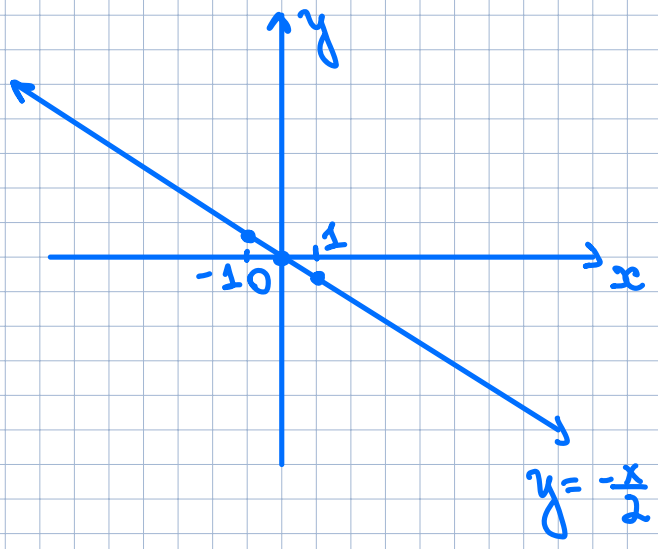
WRH 7 Solutions

3.4 : 1, 5, 11, 22, 25, 31, 35, 38, 44

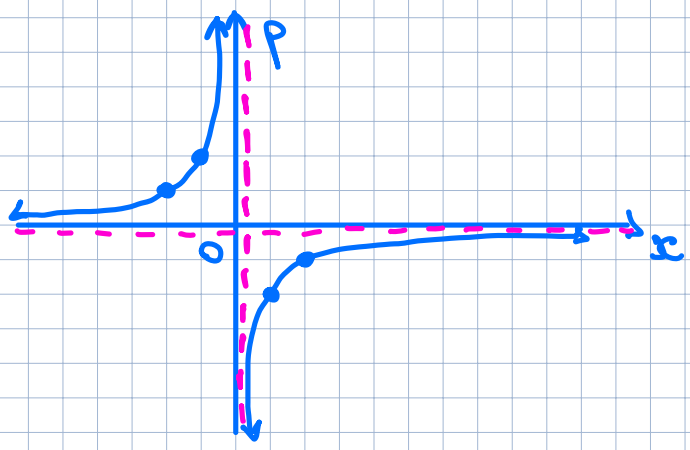
3.6 : 5

3.4

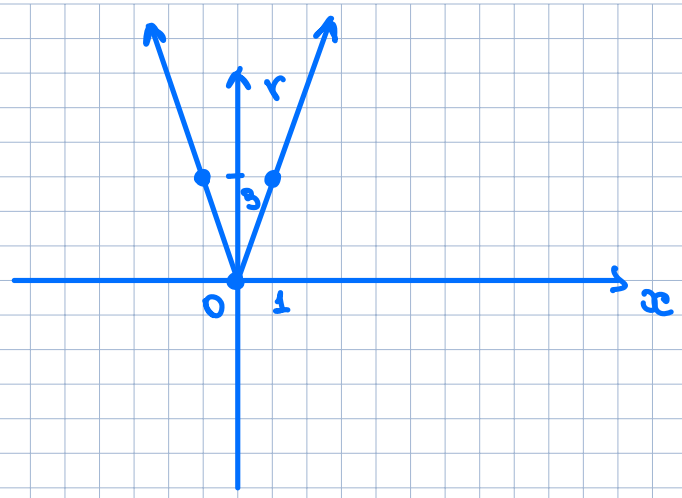
1. $f(x) = -\frac{x}{2}$



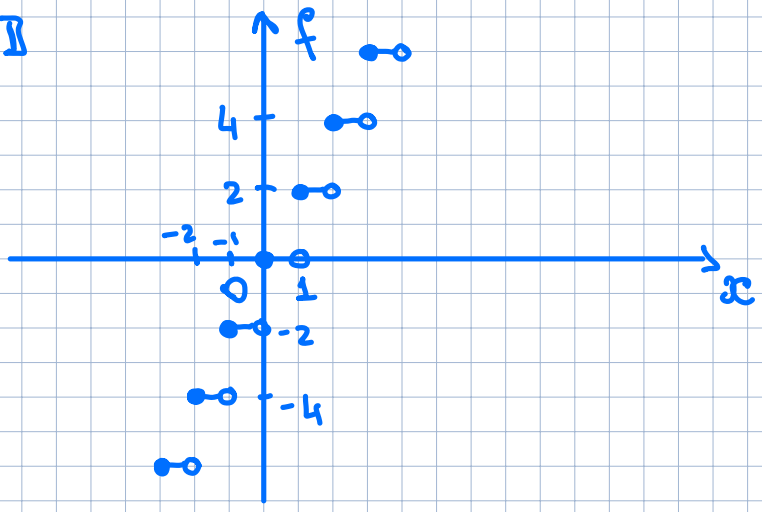
5. $p(x) = -\frac{2}{x}$



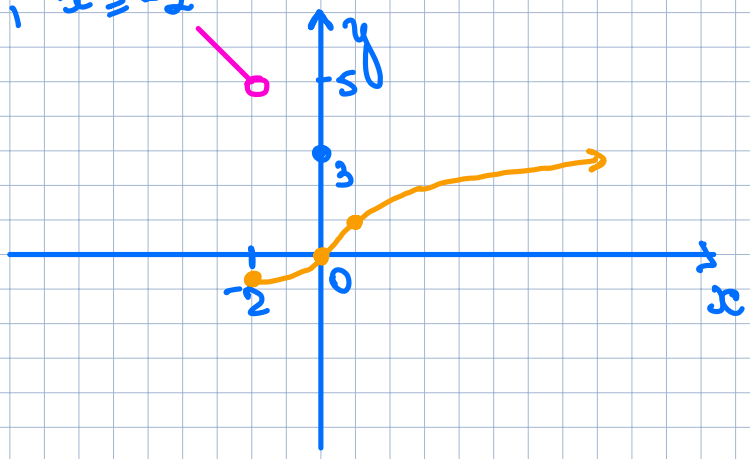
11. $r(x) = 3|x|$



22. $f(x) = 2[\![x]\!]$

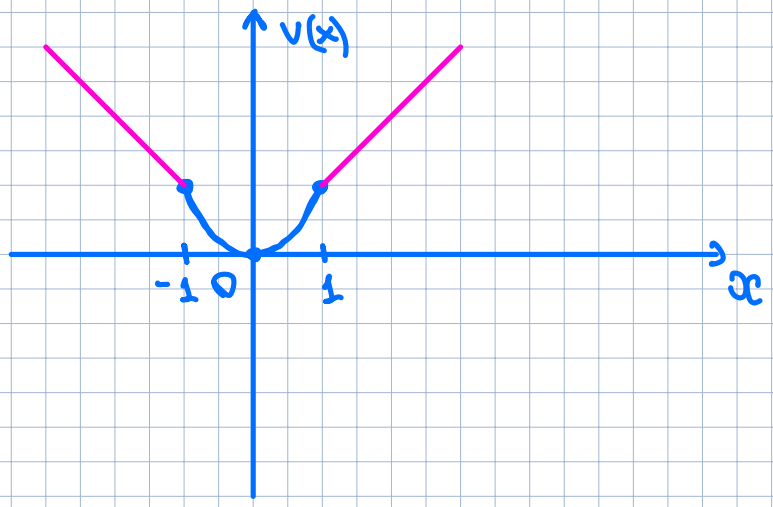


25. $f(x) = \begin{cases} 3-x & , \ x < -2 \\ x^{\frac{1}{3}} & , \ x \geq -2 \end{cases}$



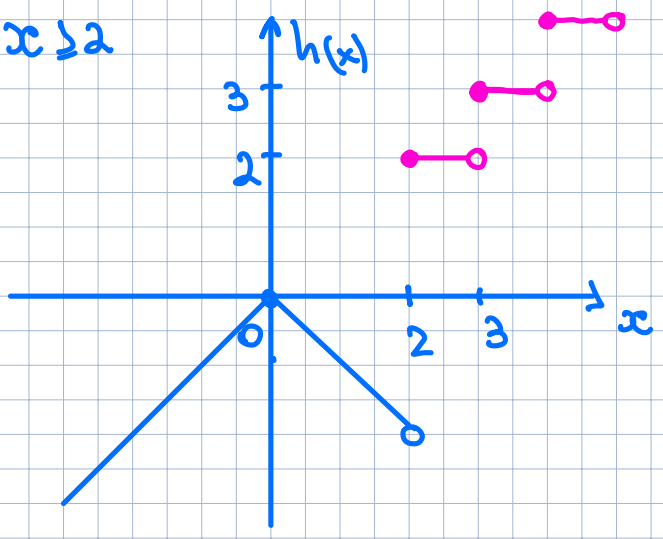
31.

$$v(x)=\begin{cases} x^2, & -1\le x\le 1 \\ |x|, & x<-1 \text{ or } x>1 \end{cases}$$



35.

$$h(x)=\begin{cases} -|x|, & x<2 \\ [\![x]\!], & x\ge 2 \end{cases}$$



38.

$$f(x)=-\frac{7}{9x^4}$$

(d)

44.

$$f(x)=\begin{cases} -4x-12, & x \le -3 \\ \frac{5}{10}x^2, & x > -3 \end{cases}$$

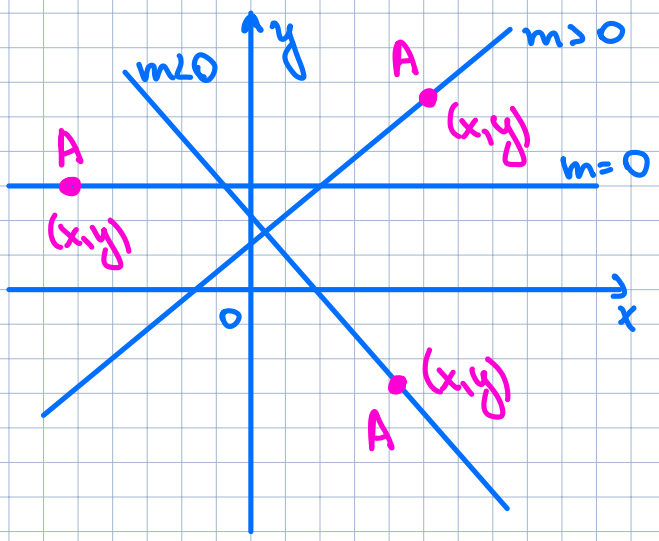
(b)

3.6

5.

$y=mx+b$

A(x,y) O(0,0)



(a)

$$d=\sqrt{(x-0)^2+(y-0)^2}$$

$$d=\sqrt{x^2+y^2}$$

(b) If L is horizontal, then $m=0$.

$y=b$

Hence, $d=\sqrt{x^2+b^2}$

(c) $y=mx+b$

$0=m\cdot 0+b \Rightarrow b=0$

$y=mx$

Hence, $d=\sqrt{x^2+m^2x^2}=\sqrt{x^2(1+m^2)}=|x|\sqrt{1+m^2}$

(d) $y = mx$ and $m = \sqrt{3}$

$y = \sqrt{3}x$

Thus, $d = \sqrt{x^2 + (\sqrt{3}x)^2} = \sqrt{x^2 + 3x^2} = 2|x|.$

4.1

1. $f(x) = -(1-x)^2 + 2$

$f(x) = -(x-1)^2 + 2$

Basic function: $g(x) = x^2$

5. $f(x) = \sqrt{x+2} - 5$

Basic function: $g(x) = \sqrt{x}$

6. $f(x) = [\![-2-x]\!]$

Basic function: $g(x) = [\![x]\!]$

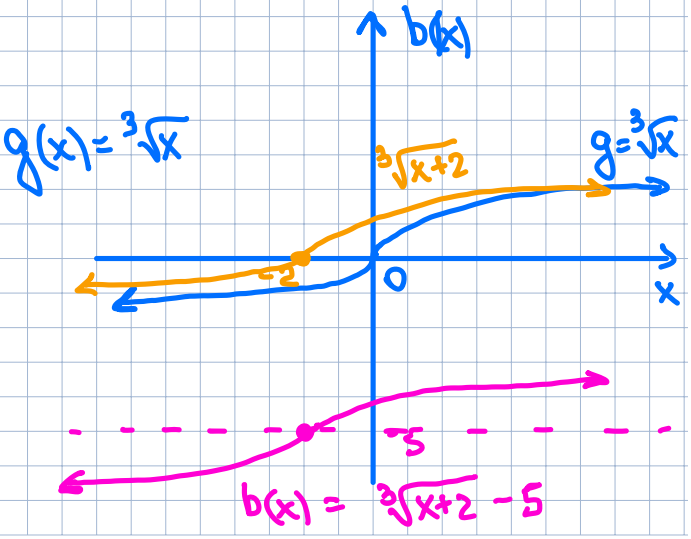
14. Basic function: $g(x) = |x|$

28. $b(x) = \sqrt[3]{x+2} - 5$

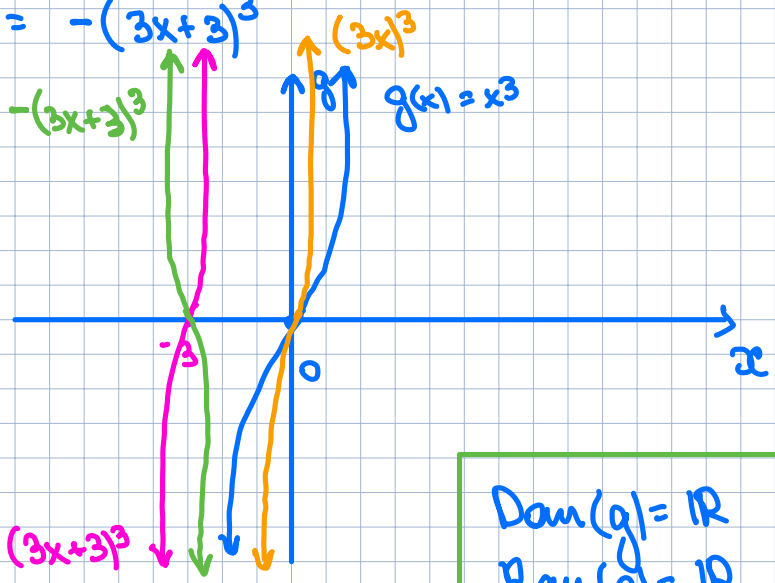
Basic function: $g(x) = \sqrt[3]{x}$

$Dom(b) = \mathbb{R}$

$Ran(b) = \mathbb{R}$



41. $g(x) = -(3x+3)^3$



$Dom(g) = \mathbb{R}$

$Ran(g) = \mathbb{R}$

46. $g(x) = x^2$

1) $g_1(x) = (x+3)^2$

2) $g_2(x) = (x+3)^2 - 4$

56. $g(x) = |x|$

1) $g_1(x) = |x+7|$

2) $g_2(x) = -|x+7|$

3) $g_3(x) = -|-x+7|$