

1-4 Notes

General Form: $y = a(f(b(x+c))) + d$

a = vertical movement, reflection

$0 < a < 1$ vertical shrink

$a > 1$ vertical stretch

$a < 0$ reflection over x-axis

mult. y-values
by a

b = horizontal movement, reflection

$0 < b < 1$ horizontal stretch

$b > 1$ horizontal shrink

$b < 0$ reflection over y-axis

divide

mult. x-values
by b

adjust table

so that $b \cdot _ = x$
of parent function

c = horizontal shift

$c > 0$ shift left

$c < 0$ shift right

d = vertical shift

$d > 0$ shift up

$d < 0$ shift down

*When you have multiple transformations,
roughly apply PEMDAS.

① start with parenthesis

② deal with multiplication

③ deal with negation

④ deal with addition/subtraction

1. $\frac{1}{x^2} = x^{-2}$

Derivative: $\frac{d}{dx} x^{-2} = -2x^{-3} = -\frac{2}{x^3}$

2. $\frac{1}{x^3} = x^{-3}$

Derivative: $\frac{d}{dx} x^{-3} = -3x^{-4} = -\frac{3}{x^4}$

3. $\frac{1}{x^4} = x^{-4}$

Derivative: $\frac{d}{dx} x^{-4} = -4x^{-5} = -\frac{4}{x^5}$

4. $\frac{1}{x^5} = x^{-5}$

Derivative: $\frac{d}{dx} x^{-5} = -5x^{-6} = -\frac{5}{x^6}$

5. $\frac{1}{x^6} = x^{-6}$

Derivative: $\frac{d}{dx} x^{-6} = -6x^{-7} = -\frac{6}{x^7}$

6. $\frac{1}{x^7} = x^{-7}$

Derivative: $\frac{d}{dx} x^{-7} = -7x^{-8} = -\frac{7}{x^8}$

7. $\frac{1}{x^8} = x^{-8}$

Derivative: $\frac{d}{dx} x^{-8} = -8x^{-9} = -\frac{8}{x^9}$

1-4 Notes

① $f(x) = x^2$

② $f(x) = x^2 + 2$

③ $f(x) = (x-5)^2$

④ $f(x) = (x+5)^2 - 6$

⑤ $f(x) = -x^2$

⑥ $f(x) = (-x)^2$

① $f(x) = x^2$

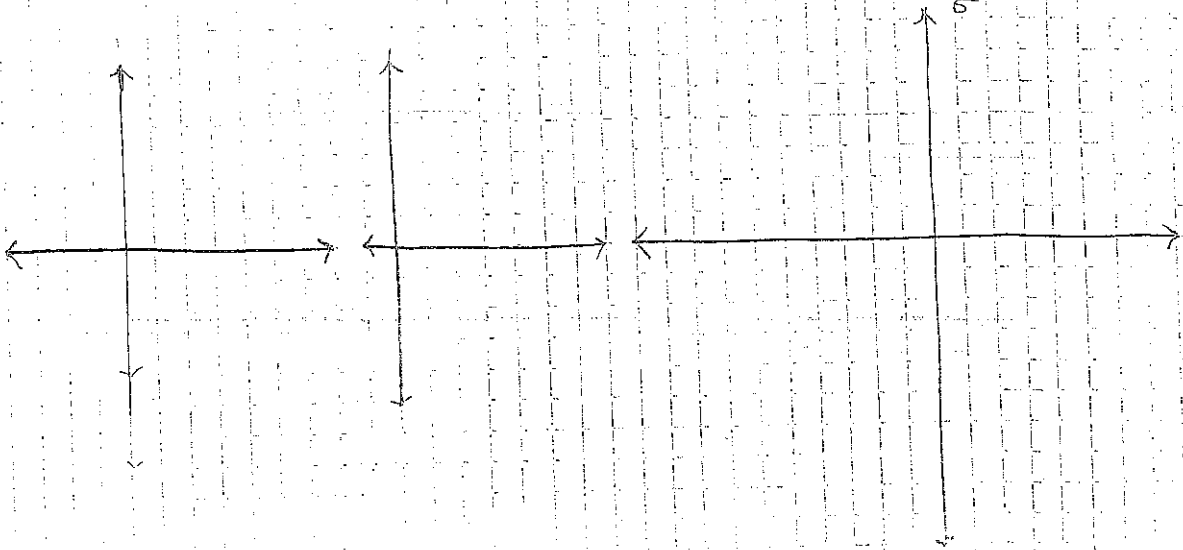
② $f(x) = 2x^2$

③ $f(x) = \frac{1}{2}x^2$

① $f(x) = x^2$

② $f(x) = (2x)^2$

③ $f(x) = \left(\frac{1}{2}x\right)^2$



① $f(x) = \sqrt{x}$

② $f(x) = \sqrt{x-5}$

③ $f(x) = \sqrt{x+6}$

④ $f(x) = \sqrt{x-3} + 4$

⑤ $f(x) = -\sqrt{x}$

⑥ $f(x) = \sqrt{-x}$

① $f(x) = \sqrt{x}$

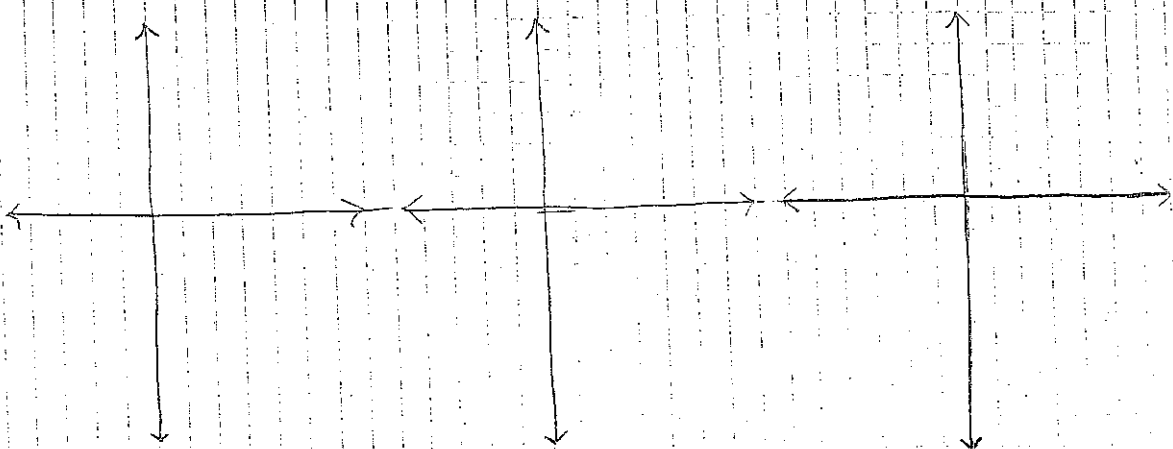
② $f(x) = 3\sqrt{x}$

③ $f(x) = \frac{1}{2}\sqrt{x}$

① $f(x) = \sqrt{x}$

② $f(x) = \sqrt{3x}$

③ $f(x) = \sqrt{\frac{1}{2}x}$

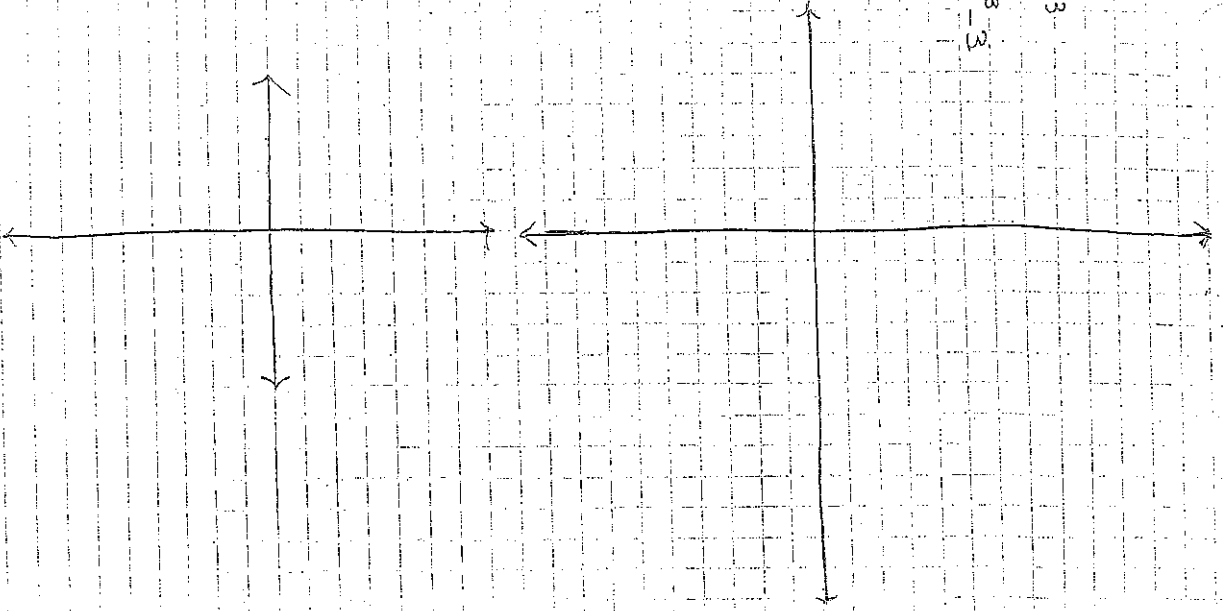


1) $f(x) = x^3$

2) $f(x) = x^2 + 4$

3) $f(x) = (x-6)^3$

1) $f(x) = (x+5)^3 - 3$



① $f(x) = x^3$

② $f(x) = 2x^3$

③ $f(x) = \left(\frac{1}{4}x\right)^3$

