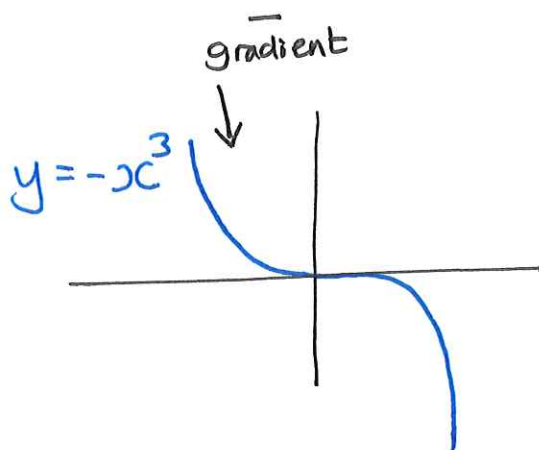
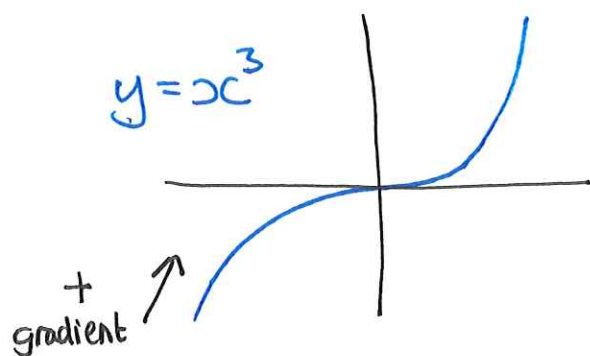
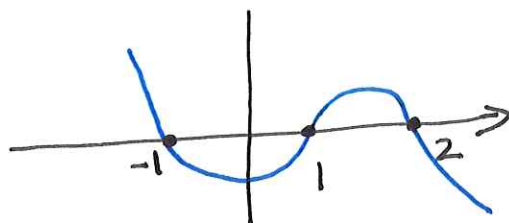


— CUBIC GRAPH



$$y = (x-2)(1-x)(1+x)$$

2 1 -1

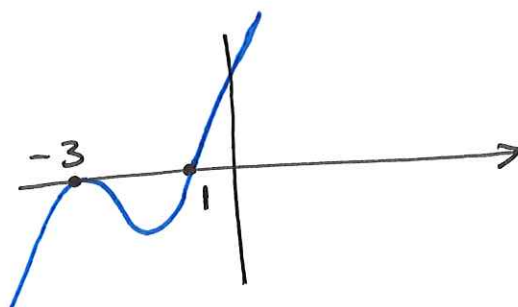


$$y = (x+3)^2(x+1)$$

$$= (x+3)(x+3)(x+1)$$

-3 -3 -1

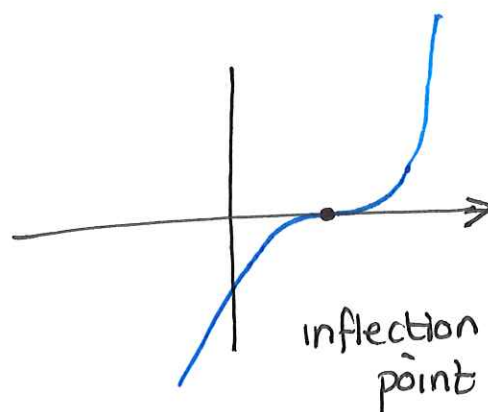
└──────────┘
bounce



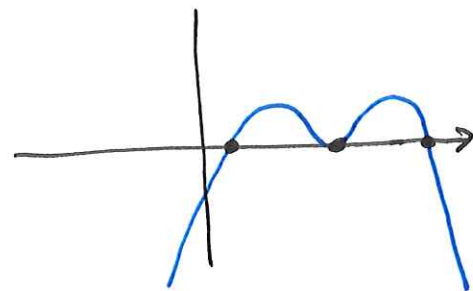
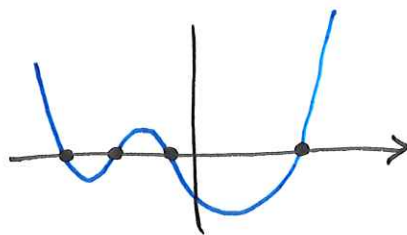
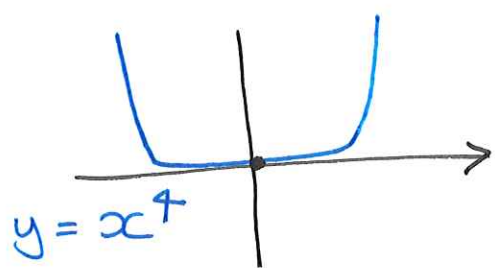
$$y = (x-2)^3$$

$$= (x-2)(x-2)(x-2)$$

2 2 2



- QUARTIC GRAPHS



$$y = (x+1)(x+2)(x-1)(x-2)$$

-1 -2 1 2

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

-2 -1 2

-2

Bounce

$$y = (x+3)^2(x-2)^2$$

-3 2

-3 2

bounce bounce

$$y = (x+3)^4$$

-3

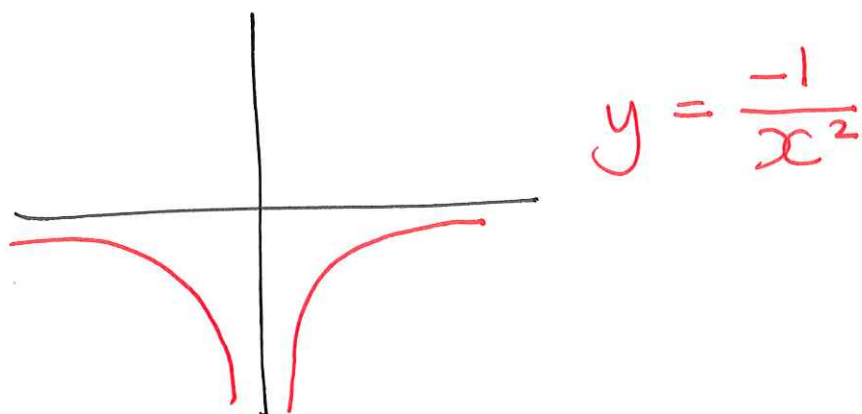
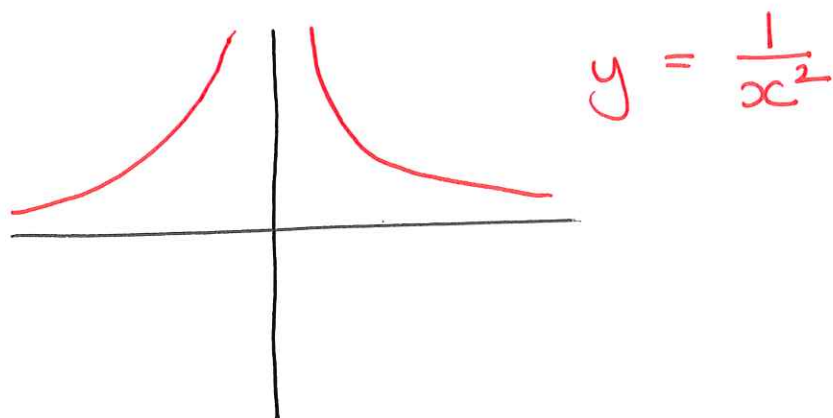
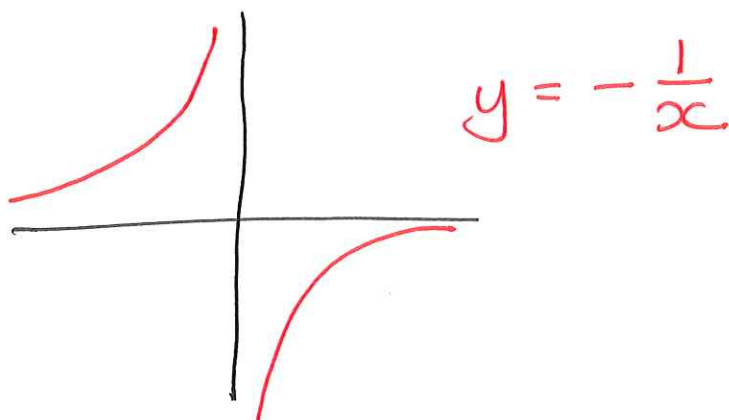
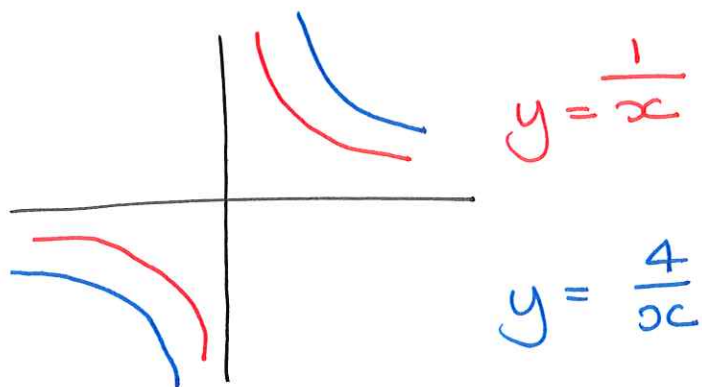
-3

-3

-3

inflection point

- RECIPROCAL GRAPHS



- POINTS OF INTERSECTION

$g(x)$ intersects $f(x)$

when

$$g(x) = f(x)$$

- TRANSFORMATIONS OF GRAPHS

$y = f(x)$ starting position

$$y = f(x) + 3 \quad \text{up } 3 \quad \uparrow$$

$$y = f(x) - 3 \quad \text{down } 3 \quad \downarrow$$

$$y = f(x + 2) \quad \text{left } 2 \quad \leftarrow$$

$$y = f(x - 2) \quad \text{right } 2 \quad \rightarrow$$

$$y = f(3x) \quad \left(\frac{x}{3}, y\right)$$

$$y = 3f(x) \quad (x, 3y)$$

$$y = f(-x) \quad \text{reflect in } x \text{ axis}$$

$$y = -f(x) \quad \text{reflect in } y \text{ axis}$$