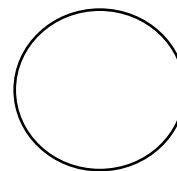


Name: _____ () Date: _____ Class: _____



Graphs of Common Functions

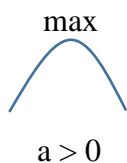
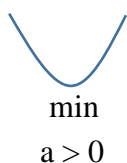
1 Linear Functions - Straight lines $y = ax + b$

- a) **Horizontal lines** $y = k$ b) **Vertical lines** $x = k$
c) **Slanted lines** $y = mx + c$
where $m = \text{gradient}$ – determines the direction of the line
 $c = \text{y intercept}$

2 Quadratic Functions – Parabolas $y = ax^2 + bx + c$

Shape – determined by a - coefficient of x^2 term

- must be symmetrical



Line of symmetry : a vertical line that passes through the turning point

a) $y = a(x-h)(x-k)$ use x intercepts to find T.P.

Step 1: determine shape and max / min

Step 2: find x intercepts \rightarrow sub $y = 0$ and solve for $x \rightarrow x_1$ & x_2

Step 3: find turning point

$$x \text{ co-ordinate} = \frac{x_1 + x_2}{2}$$

y co-ordinate \rightarrow sub x co-ord of T.P. into eqn

Step 4: find y intercept \rightarrow sub $x = 0$ and solve for y

b) $y = a(x-p)^2 + q$ read T.P. co-ordinates directly from eqn

Step 1: determine shape and max / min

Step 2: find turning point $\rightarrow (p, q)$

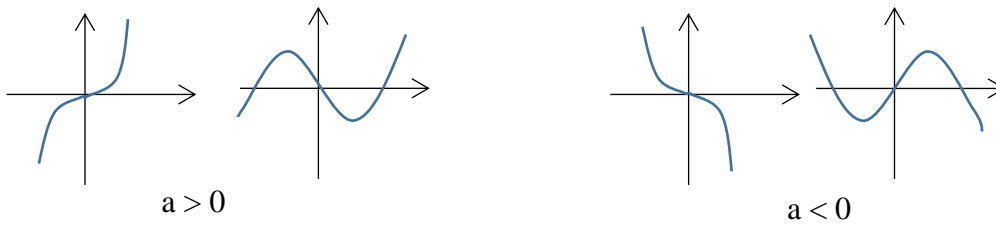
Step 3: find x intercepts \rightarrow sub $y = 0$ and solve for x

If min / max pt is above / below the x axis \rightarrow no x intercepts

Step 4: find y intercept \rightarrow sub $x = 0$ and solve for y

3 Cubic Functions $y = ax^3 + bx^2 + cx + d$

Shape - determined by a - coefficient of x^3 term.



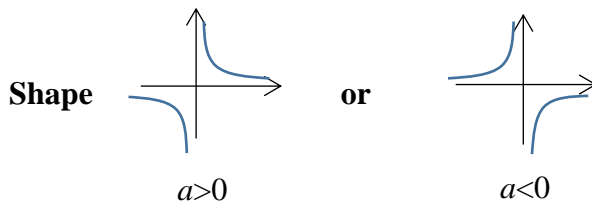
4 Reciprocal Functions – hyperbolas $y = \frac{a}{x^n}$

Reciprocal curves occur in pairs

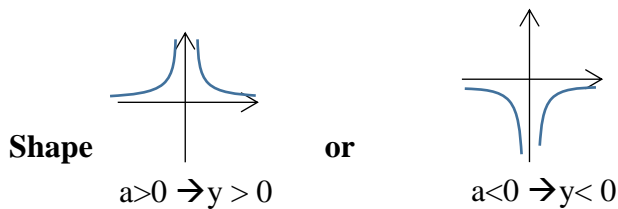
Have x and y axes as asymptotes ie curve gets closer to axes but will not touch axes

Curves **MUST NOT** curved inward **

a) If n is odd



b) If n is even



5 Exponential Functions $y = ka^x$ where $a > 0$

Shape

x axis is asymptote

y intercept is at k

$a > 1$ eg. $y = e^x$

$0 < a < 1$ eg. $y = 2^{-x}$

