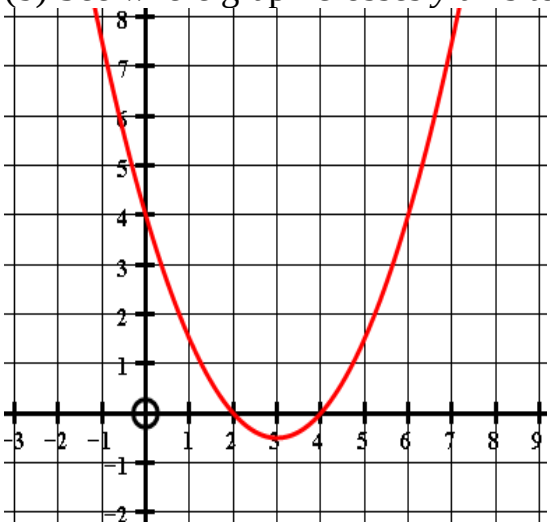
FINDING EQUATIONS OF GRAPHS.

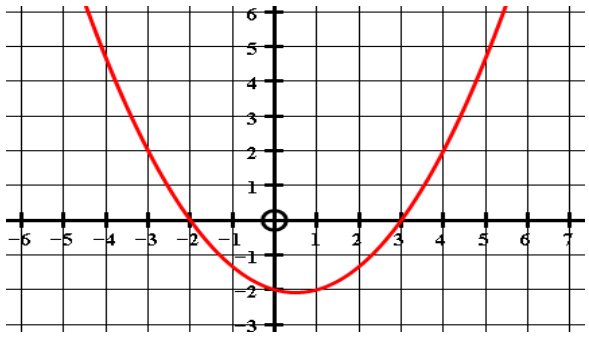
Hints:
(a) See where graph crosses x axis. eg at 2 and 4 so basis is $y = \boldsymbol{a}\,(x-2)(x-4)$
(b) See where graph crosses y axis to work out the value of $\boldsymbol{a}$



Crosses x axis at 2 and 4 so equ is of the form $y = \boldsymbol{a}\,(x-2)(x-4)$.
Crosses y axis at 4 so subs $x = 0, y = 4$ to find the constant $\boldsymbol{a}$.
$4 = a\,(0-2)(0-4)$
$4 = 8a$
$a = \frac{1}{2}$
Equation is $y = \frac{1}{2}(x-2)(x-4)$
OR $y = \dfrac{(x-2)(x-4)}{2}$

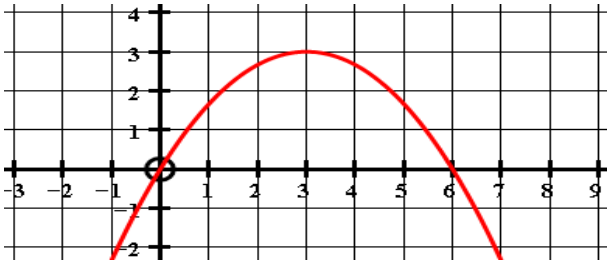
Find the equations of the following curves:

1.



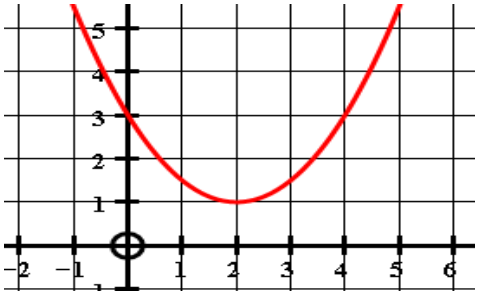
$y = \dfrac{(x+2)(x-3)}{3}$

2.



N.B. when parabola goes through the point (0, 0) use another point such as the max point (3, 3)
$y = \dfrac{-x\,(x-6)}{3}$

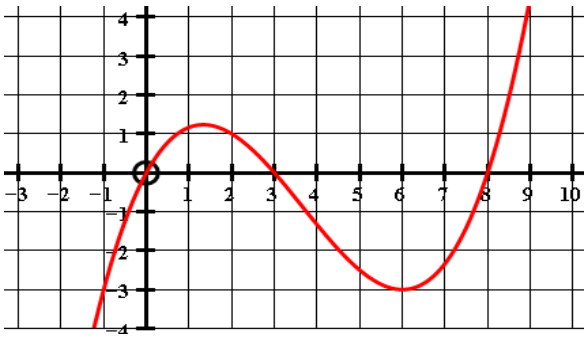
3.



N.B. when parabola does not cross the x axis it is of the form $\boldsymbol{y = a(x-b)^2 + c}$
From the graph, $\boldsymbol{b}$ and $\mathbf{c}$ should be obvious.
Work out c using (0, 3).

$y = \dfrac{(x-2)^2}{2} + 1$

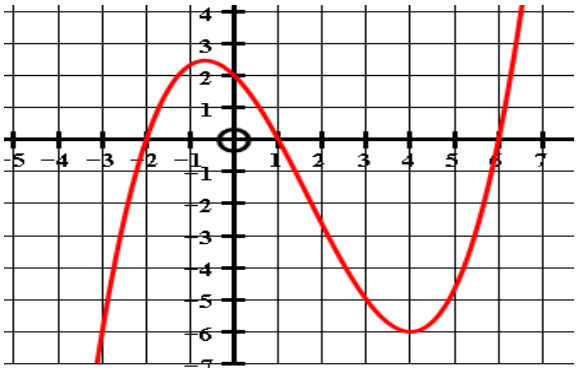
4.



Equ will be of the form :
$y = p\,x(x-a)(x-b)$
a and b *should be obvious.*
To find ***p*** you need to subs a point such as (2,1) or min (6, -3)

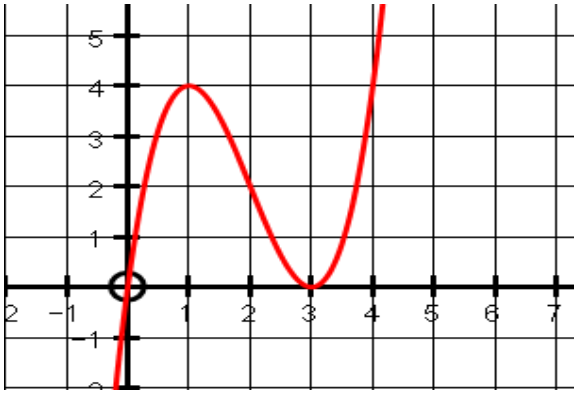
$$y = \frac{x(x-3)(x-8)}{12}$$

5.



$$y = \frac{(x+2)(x-1)(x-6)}{6}$$

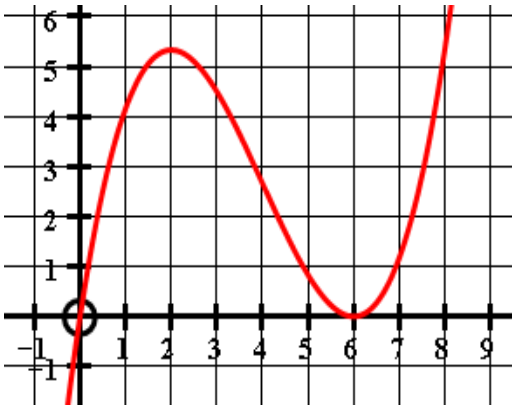
6.



Equ will be of the form :
$y = p\,x(x-a)^2$
a *should be obvious.*
To find ***p*** you need to subs a point such as (2,2) or max (1, 4)

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

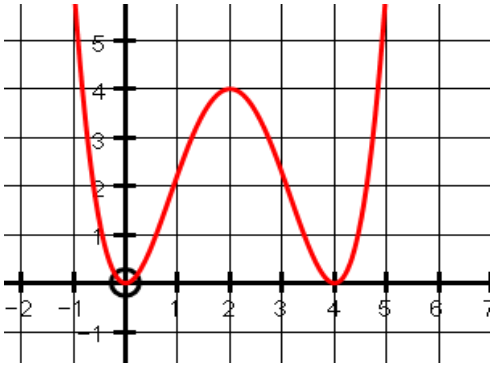
7.



Equ will be of the form :
$y = p\,x(x-a)^2$
a *should be obvious.*
To find ***p*** you need to subs a point such as (1, 4)

$$y = \frac{4x(x-6)^2}{25}$$

8.



Equ will be of the form :

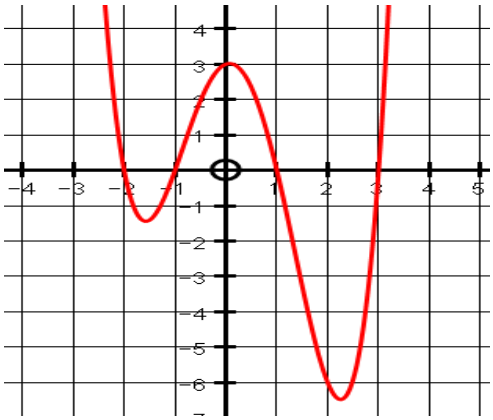
$y = p\,x^2(x-a)^2$

a *should be obvious.*

To find ***p*** you need to subs a point such as max (2, 4)

$$y = \frac{x^2\,(x-4)^2}{4}$$

9.



Equ will be of the form :

$y = p\,(x+a)(x+b)(x-c)(x-d)$

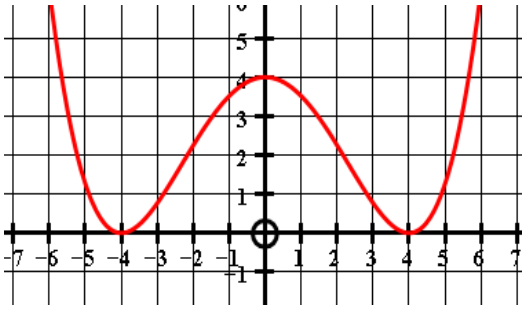
a, b, c and d *should be obvious.*

To find ***p*** you need to subs a point such as (0, 3) or (2, -6)

N.B. Sometimes the graph **seems** to go through points such as (3, -1) but it does not.

$$y = \frac{(x+2)(x+1)(x-1)(x-3)}{2}$$

11.



Equ will be of the form :

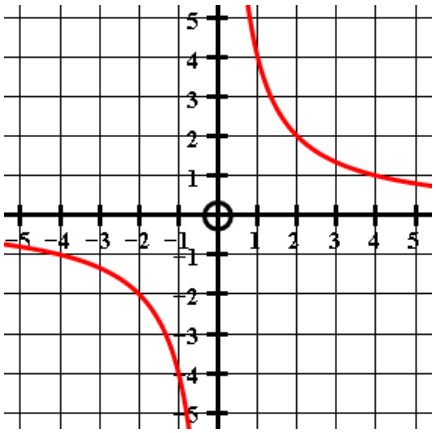
$y = p(x+a)^2(x-b)^2$

a and b *should be obvious.*

To find ***p*** you need to subs a point such as max (0, 4)

$$y = \frac{(x+4)^2\,(x-4)^2}{64}$$

12.

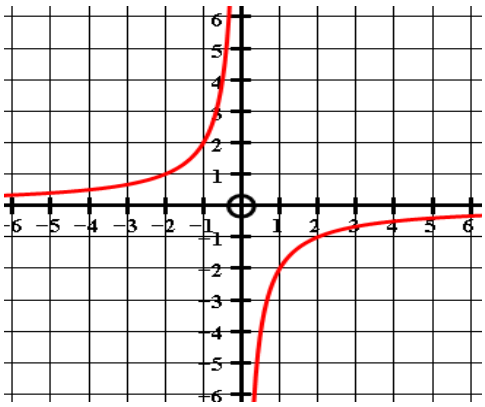


Equ will be of the form : $y = \frac{b}{x}$ ***or*** $xy = b$

Choose a point such as (2, 2) or (4, 1) to find ***b***

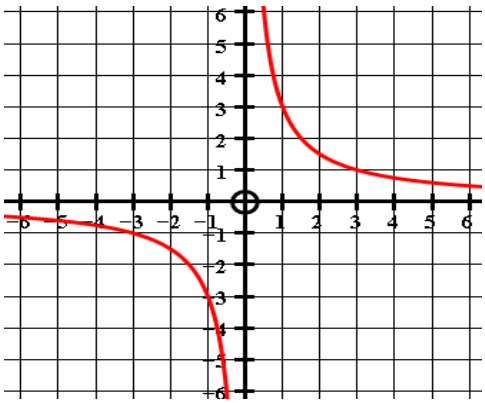
$$y = \frac{4}{x}$$

13.



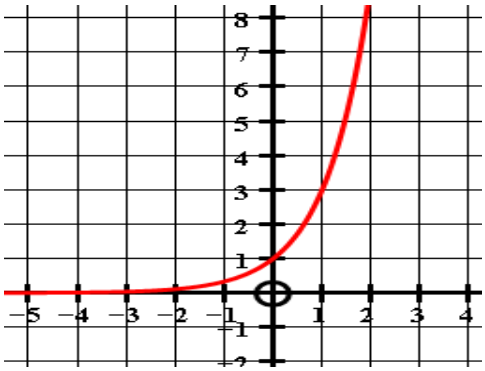
$y = \frac{-2}{x}$

14.



$y = \frac{3}{x}$

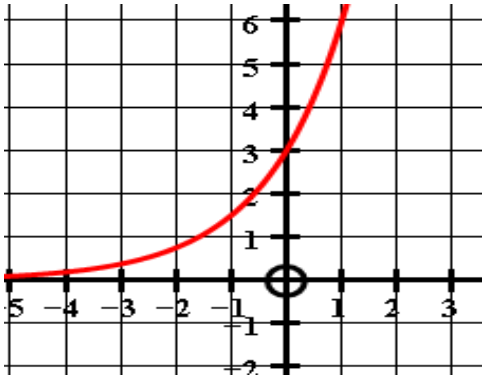
15.



Equ will be of the form : $y = b^x$ ***and such graphs go through (0, 1)***
Look for a point such as (1, 3) to find ***b***

$y = 3^x$

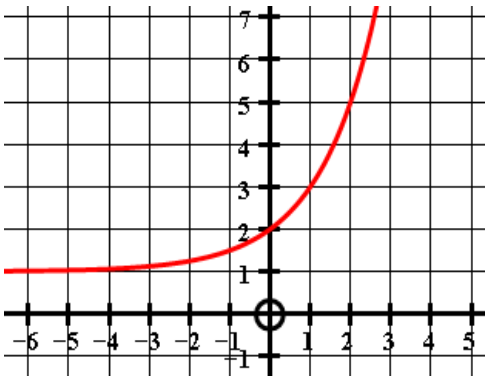
16.



This does not go through (0, 1) so the equation is of the form $y = a \times b^x$
Subs $x = 0, y = 3$ to find ***a*** and then look for a point such as (1, 6) to find ***b***

$y = 3 \times 2^x$

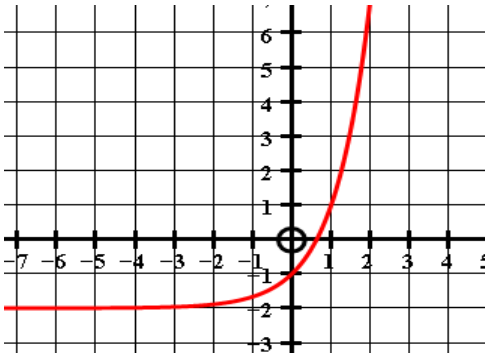
17.



This "growth" or exponential curve does not approach zero so its equ must be of the form: $y = b^x + c$ clearly c = 1
Find a suitable point for substitution such as (1, 3) or (2, 5) to find b

$y = 2^x + 1$

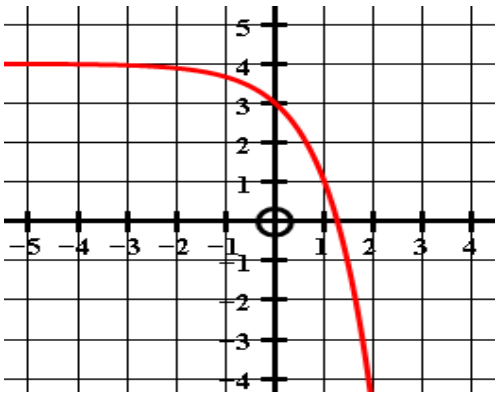
18.



Equ must be of the form: $y = b^x - c$ clearly $y = b^x - 2$
Find a suitable point to subs and find b

$y = 3^x - 2$

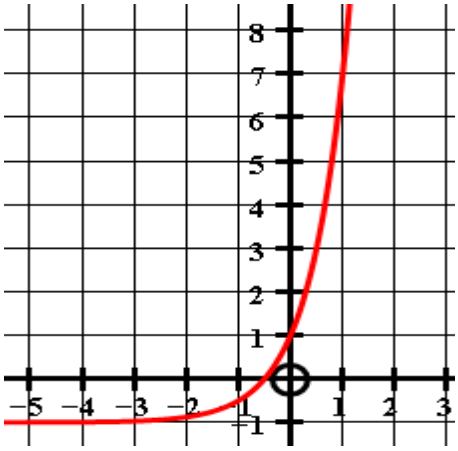
19.



Equ must be of the form: $y = -b^x + c$

$y = -3^x + 4$

20.



Find the equ in the form $y = a \times b^x - c$
use the coordinates (0, 1) and (1, 7)

$y = 2 \times 4^x - 1$