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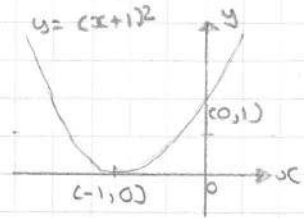
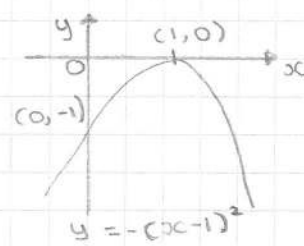
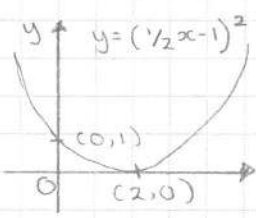
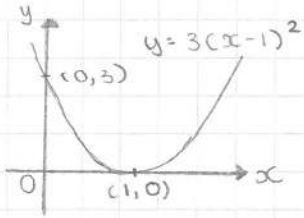
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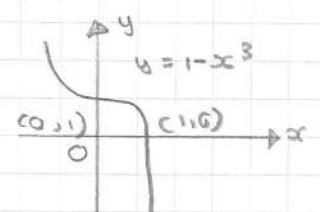
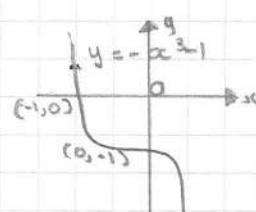
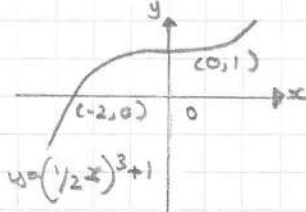
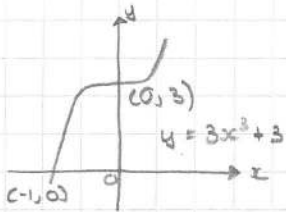
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Solution Bank-4.6

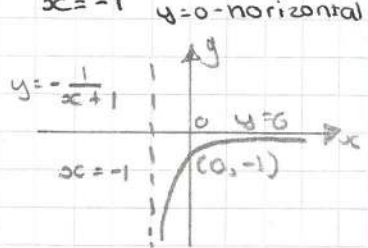
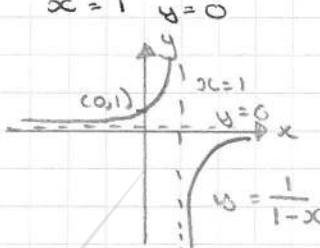
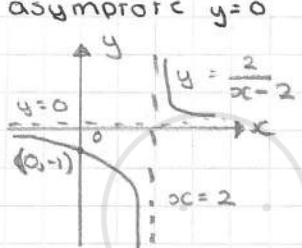
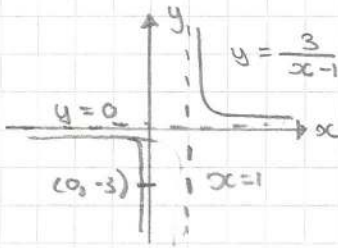
- ① a) i)  $x=1$   $(1,0)$   $(0,3)$  no asymptotes  
 ii)  $x=2$   $(2,0)$   $(0,1)$  no asymptotes  
 iii)  $(1,0)$   $(0,-1)$  no asymptotes  
 iv)  $x=-1$   $(-1,0)$   $(0,1)$  no asymptotes



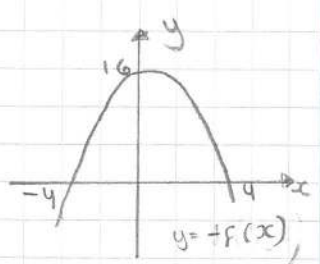
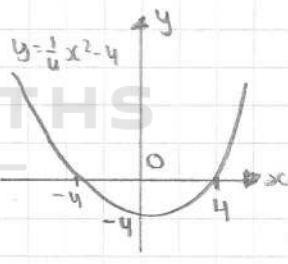
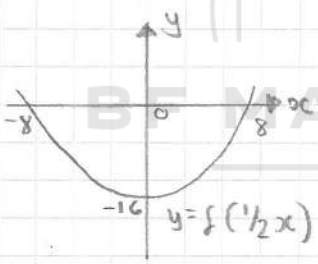
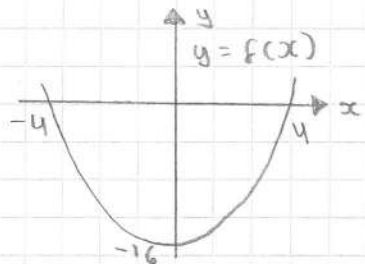
- b) i)  $x=-1$   $y=(0,3)$  ii)  $x=-2$   $y=(0,1)$  iii)  $x=-1$   $y(0,-1)$  iv)  $x=1$   $y=(0,1)$



- c) i) asymptotes  $x=1$   $y=0$  ii)  $x=2$  asymptote  $y=0$  iii) asymptotes  $x=1$   $y=0$  iv) vertical asymptote  $x=-1$   $y=0$  horizontal

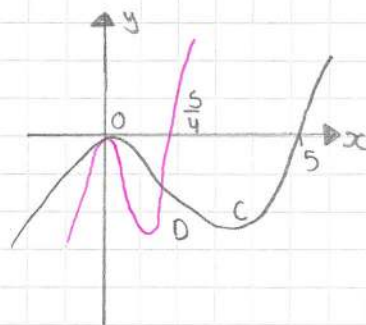


- ② a)  $y=f(x) = x^2 - 16$   $x=\pm 4$   $y=(0,16)$   
 b) i)  $y = (\frac{1}{2}x)^2 - 16 = \frac{1}{4}x^2 - 16$   $(0,-16)$   $x=\pm 8$   
 ii)  $y = \frac{1}{4}(x^2 - 16) = \frac{1}{4}x^2 - 4$   $(0,-4)$   $x=\pm 8$   
 iii)  $y = -(x^2 - 16) = -x^2 + 16$   $(0,16)$   $x=\pm 4$



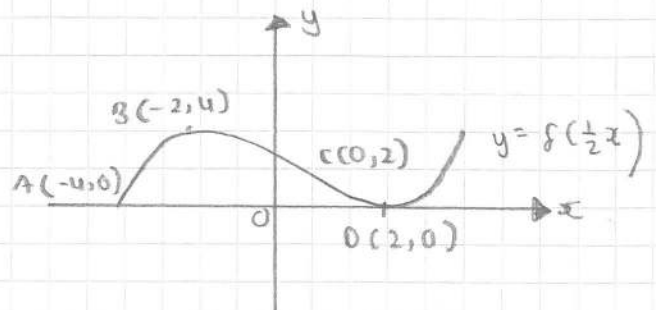
- c) i)  $(0,-16)$  ii)  $(0,-4)$  iii)  $(0,16)$

- ③ a, b)  $y = x^2(x-5)$   $x=0$   $x=5$  vertex  $(0,0)$



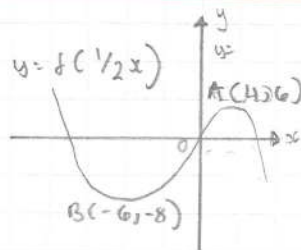
- Curve  $D = y = 16x^2(4x-5)$   $x=0$   $x=5/4$  vertex  $(0,0)$

- ④ A  $(-2,0)$   $2 \times (-2) = -4$   
 $\therefore A'(-4,0)$   
 B  $(-1,4)$   $2 \times (-1) = -2$   
 $\therefore B'(-2,4)$   
 C  $(0,2)$   $2 \times 0 = 0$   
 $\therefore C'(0,2)$   
 D  $(1,0)$   $2 \times 1 = 2$   
 $\therefore D'(2,0)$

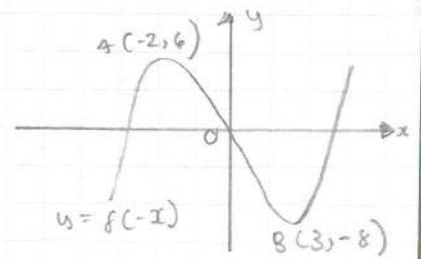


c) stretch by scale factor  $1/4$  in the horizontal direction.

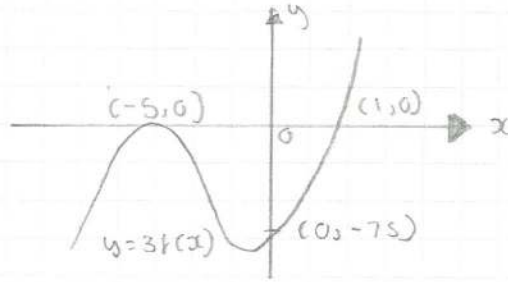
- ⑤ a)  $y = f(1/2x)$   
 $A(2,6)$   $A'(4,6)$   
 $B(-3,-8)$   $B'(-6,-8)$   
 origin meets  $(0,0)$



- b)  $y = f(-x)$   
 $A(2,6)$   $A'(-2,6)$   
 $B(-3,-8)$   $B'(3,-8)$   
 origin  $(0,0)$



- ⑥ a)  $y = 3f(x)$   
 $x$  intercept  $(1,0)$   $(-5,0)$   
 $y$  intercept  $(0,-7.5)$   
 $(-2.5,-7.5) \rightarrow 3x-2.5 = -7.5$   
 $(1,0)$   $(5,0)$   $(-2.5,-7.5)$



b)  $y = 3(x+5)^2(x-1)$

- ⑦ a)  $y = f(ax)$   
 factor  $\frac{1}{a}$   
 $(-2,12) \rightarrow$  turning point  
 transforms  $(-\frac{1}{a},12)$   
 $-\frac{2}{a} = -\frac{1}{a}$   
 $a = (-2) / (-\frac{1}{a}) = 8$

- b)  $y = bf(cx)$   
 turning point  $(-2,12)$   
 transform  $\rightarrow (-2,6)$   
 $12b = 6$   
 $b = 1/2$



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