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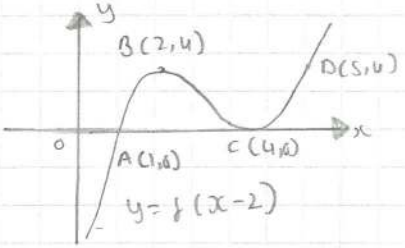
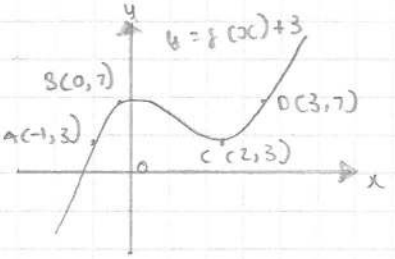
Solution Bank 4.7

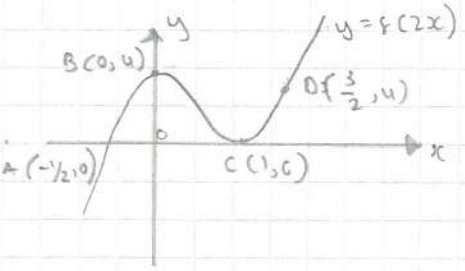
① a) A'(-1+2,0) = (1,0)
B'(0+2,4) = (2,4)
C'(2+2,0) = (4,0)
D'(3+2,4) = (5,4)



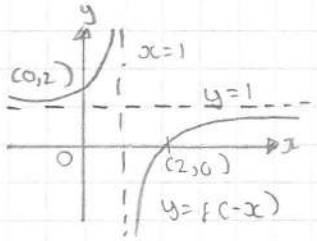
b) A''(-1,0)+3 = (-1,3)
B''(0,4+3) = (0,7)
C''(2,0+3) = (2,3)
D''(3,4+3) = (3,7)



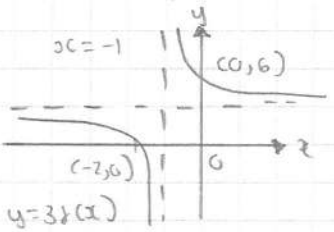
c) A'''(-1/2,0) = (-½,0)
B'''(0/2,4) = (0,4)
C'''(2/2,0) = (1,0)
D'''(3/2,4) = (3/2,4)



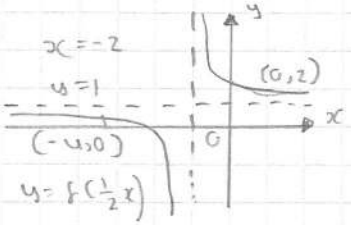
② a) asymptotes y=1 x=1
x (2,0) y (0,2)



b) asymptote x=-1 y=3
x (-2,0) y (0,6)



c) asymptote y=1 x=-2
x (-4,0) y (0,2)

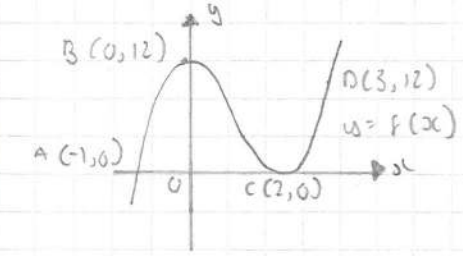


③ a) A(-1, 0/2) → A(-1,0)
B(0, -9/2) → B(0,-4.5)
C(1, -16/2) → C(1,-8)
D(3, 0/2) → D(3,0)

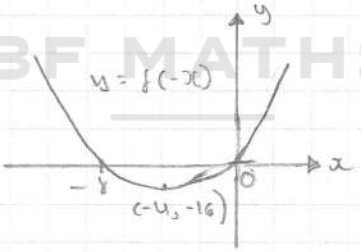
b) A(-1, 0×4) → A(-1,0)
B(0, -9×4) → B(0,-36)
C(1, -16×4) → C(1,-64)
D(3, 0×4) → D(3,0)

c) A(-1, 0-1) → A(-1,-1)
B(0, -9-1) → B(0,-10)
C(1, -16-1) → C(1,-17)
D(3, 0-1) → D(3,-1)

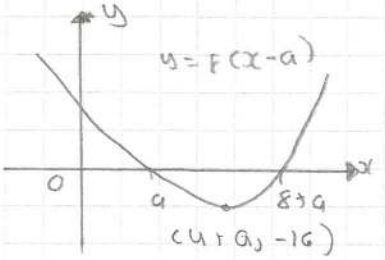
④ A(-4+3, 0) = (-1,0)
B(-3+3, 12) = (0,12)
C(-1+3, 0) = (2,0)
D(0+3, 12) = (3,12)



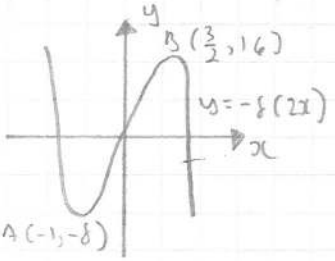
⑤ a) (0,0) (5,0)
(4,-16) → (-4,-16)
(0,0) (-4,-16) (5,0)



b) (0,0) → (a,0)
(5,0) → (5+a,0)
(4,-16) → (4+a,-16)



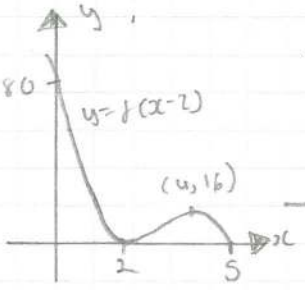
⑥ A(-2,8) → (-1,8)
B(3,-16) → (1.5,-16)
origin (0,0)
reflection: (-1,-8)
(1.5,16)

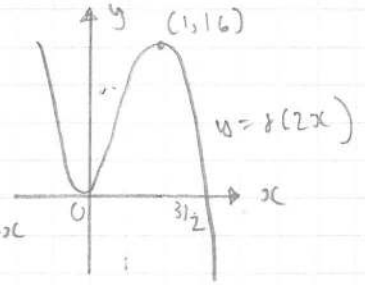


⑦ a) $y = x^2(12-4x)$ $y=0$
$x^2(12-4x) = 0$
$x^2 = 0$ or $12-4x = 0$
$x = 0$ or $x = 3$
A = (3,0)

b) i) (×2) (2,16) → (4,16)
(0,0) → (2,0)
(3,0) → (5,0)

ii) (÷2) (2,16) → (1,16)
(0,0) → (0,0)
(3,0) → (3/2,0)





⑧ f(x) + a = 0 → f(x) = -a
y = f(x) local max 6
at x=3 asymptote y=2
(3,6) f(3) = 6 → y=2
f(x) = -a
max value a = -6
asymptote a = -2
a = 6
a ≥ -2

$\{a: a = -6\} \cup \{a: a \geq -2\}$

7c) y = f(x) + k local max point
(2,5)
y = f(x) local max point
(2,16)
16 - 5 = 11 ∴ k = -11