

① $g(x) = 3\sqrt{6x+18} - 5$

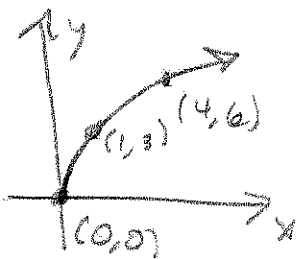
M1 \sqrt{x}



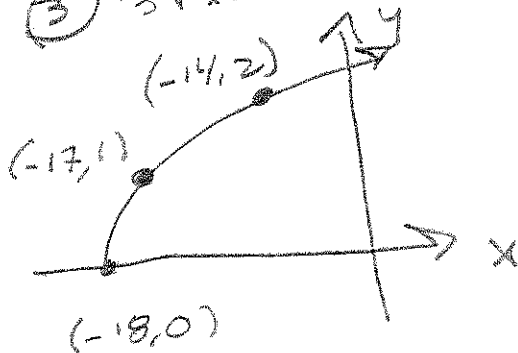
M2 see ①

② $3\sqrt{x}$ see ②

② $3f(x) = 3\sqrt{x}$

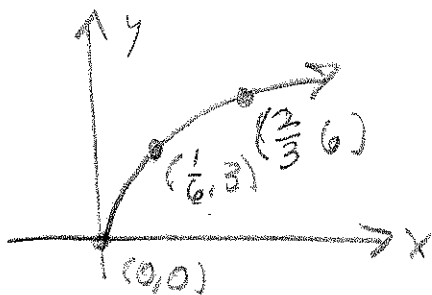


③ $3\sqrt{x+18} = 3f(x+18)$

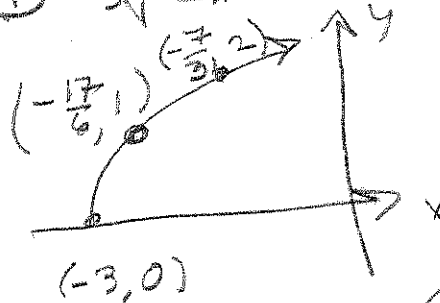


③ $3f(6x) = 3\sqrt{6x}$

$\frac{y}{6} = \frac{2}{3}$

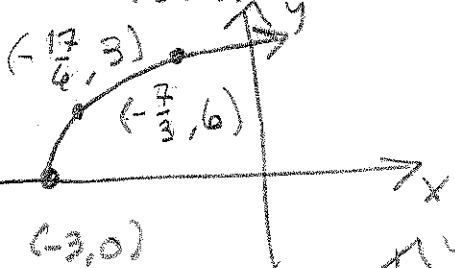


④ $3\sqrt{6x+18} = 3f(6x+18)$



④ $3f(6(x+3))$

$= 3\sqrt{6(x+3)}$



⑤ Down 5. see ⑤

y-int: $g(0) = 3\sqrt{18} - 5$

$= 3 \cdot 3\sqrt{2} - 5$
 $= 9\sqrt{2} - 5$

x-int: $g(x) = 0$

$3\sqrt{6x+18} - 5 = 0$

$3\sqrt{6x+18} = 5$

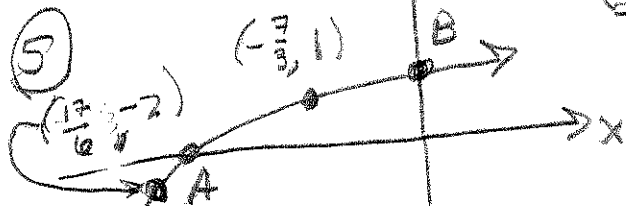
$\sqrt{6x+18} = \frac{5}{3}$

$6x+18 = \frac{25}{9}$

$6x = -18 + \frac{25}{9}$

$= -\frac{137}{9}$

$x = -\frac{137}{54}$

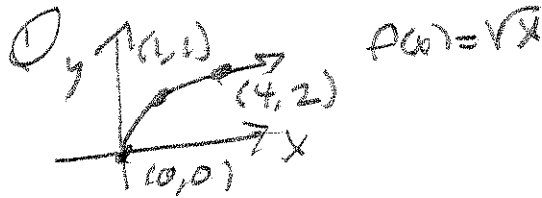


$g(x) = 3f(6(x+3)) - 5$
 $= 3\sqrt{6(x+3)} - 5$

$A = (-\frac{137}{54}, 0)$
 $\approx (-2.5370, 0)$

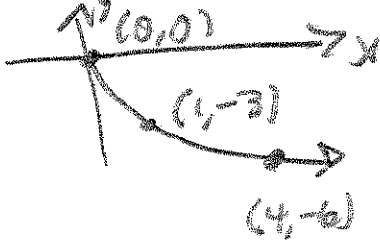
121 WP #2

(2) $g(x) = -3\sqrt{6x+18} + 5$



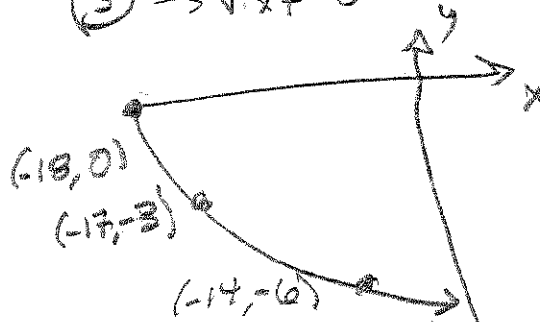
m1

(2) $-3\sqrt{x} = -3f(x)$

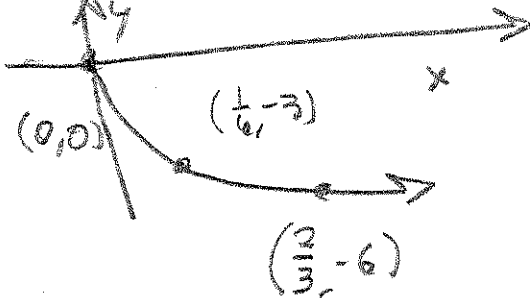


m2 (2) see (2)

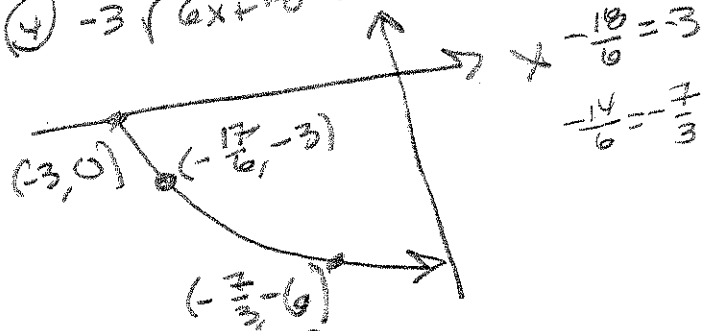
(3) $-3\sqrt{6x+18}$



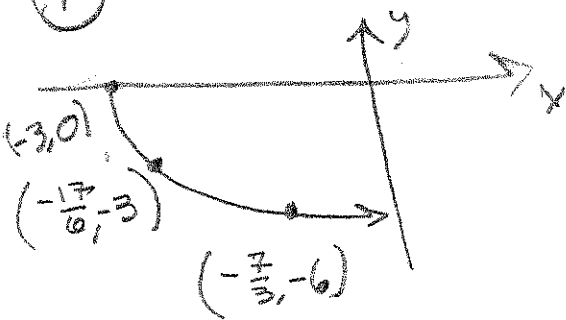
(3) $-3f(6x) = -3\sqrt{6x}$



(4) $-3\sqrt{6x+18} = -3f(6x+18)$

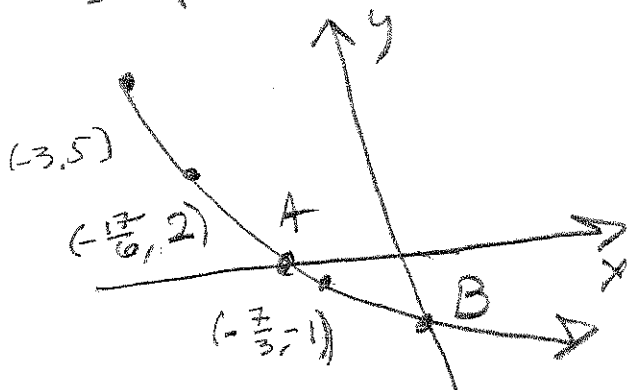


(4) $-3f(6(x+3)) = -3\sqrt{6(x+3)}$



(5) see (5)

(5) $-3f(6(x+3)) + 5 = -3\sqrt{6(x+3)} + 5 = g(x)$



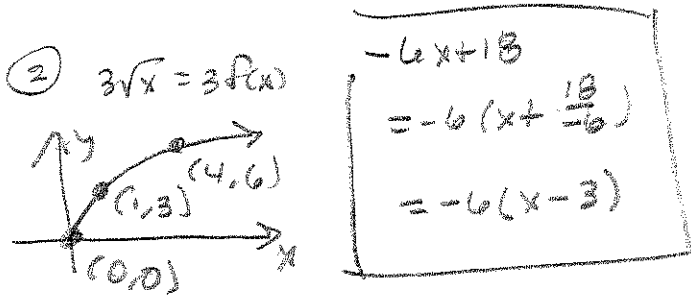
$y=0 \Rightarrow g(x) = -3\sqrt{6x+18} + 5$
 $= -3 \cdot 3\sqrt{2} + 5$
 $B = (0, -9\sqrt{2} + 5)$
 $\approx (0, -7.72922)$

$x=0 \Rightarrow g(x) = 0$
 $-3\sqrt{6x+18} + 5 = 0$
 $-3\sqrt{6x+18} = -5$
 $\sqrt{6x+18} = \frac{5}{3}$
 $6x+18 = \frac{25}{9}$
 $6x = \frac{-162+25}{9}$
 $x = \frac{-137}{54}$

$A = (-\frac{137}{54}, 0)$
 $= (-2.5370, 0)$

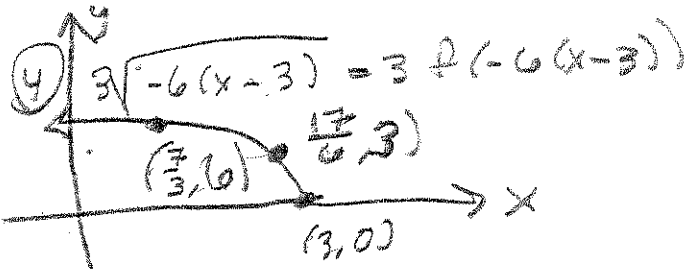
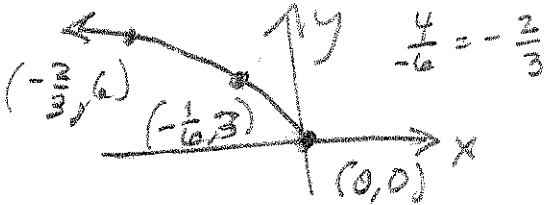
121 WP #2

③ $g(x) = 3\sqrt{-6x+18} + 5$

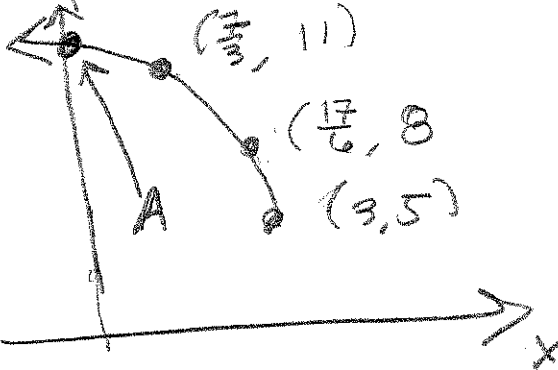


Factoring out the -6.

③ $3\sqrt{-6x} = 3f(-6x)$

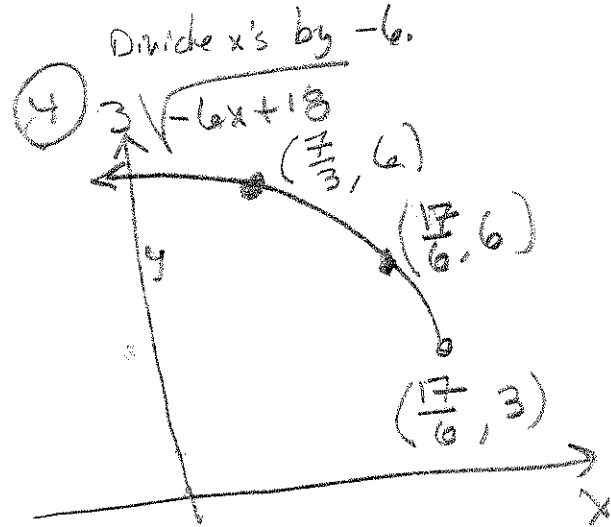
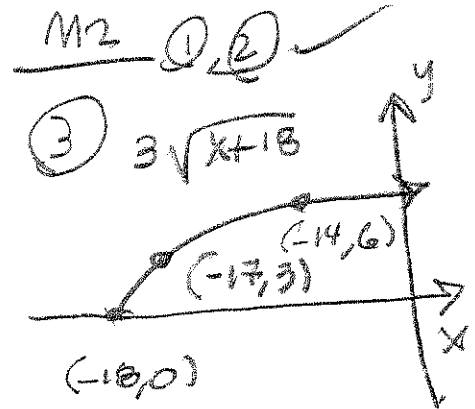


⑤ $3\sqrt{-6(x-3)} + 5 = g(x)$



y-int: $g(0) = 3\sqrt{18} + 5$
 $= 9\sqrt{2} + 5 \approx 17.72792206$

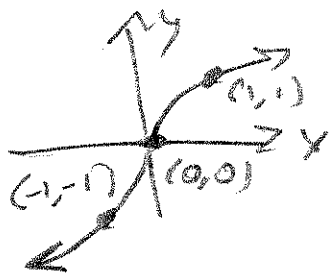
$$\begin{aligned} A &= (0, 9\sqrt{2} + 5) \\ &\approx (0, 17.72792206) \end{aligned}$$



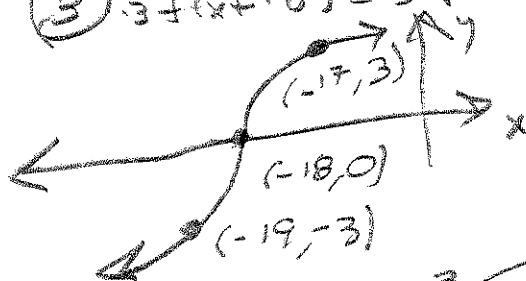
M2 ① See ①, ② See ②

⑧ $g(x) = 3\sqrt[3]{6x+18} + 5$

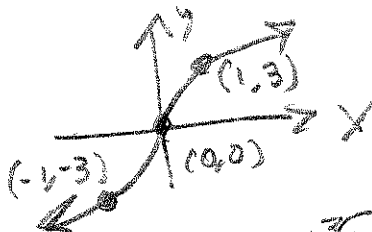
① $f(x) = \sqrt[3]{x}$



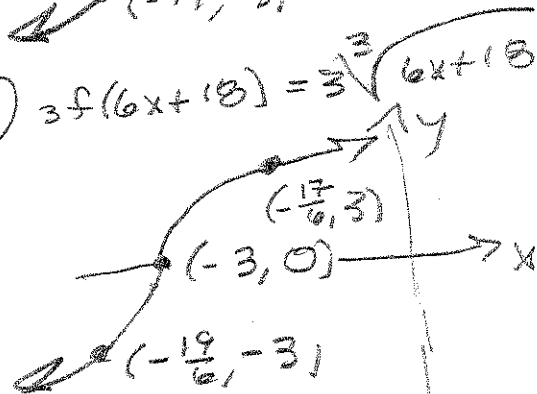
③ $3f(x+18) = 3\sqrt[3]{x+18}$



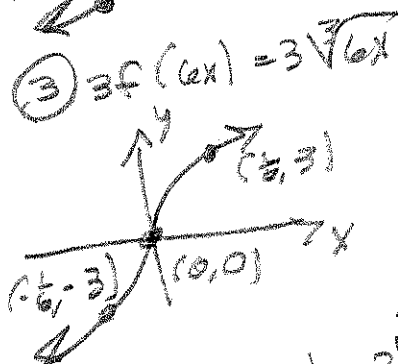
② $3f(x) = 3\sqrt[3]{x}$



④ $3f(6x+18) = 3\sqrt[3]{6x+18}$



③ $3f(6x) = 3\sqrt[3]{6x}$



⑤ See ⑤

2/18
3/9
3
Nothing here for a cube root extraction

y-int: $g(0) = 3\sqrt[3]{18} + 5$

$B = (3\sqrt[3]{18} + 5, 0)$
 $\approx (12.86222418, 0)$

x-int: $g(x) = 0$
 $3\sqrt[3]{6x+18} + 5 = 0$

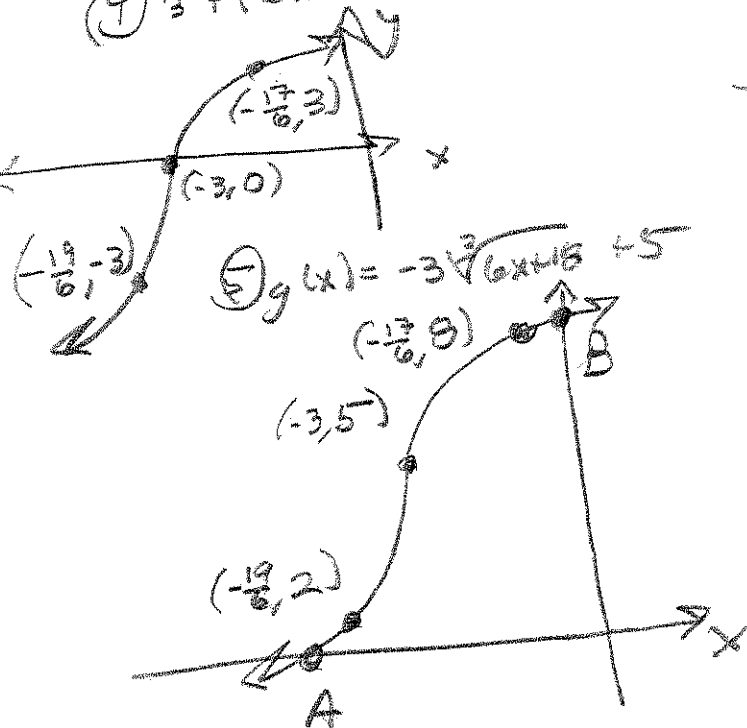
$3\sqrt[3]{6x+18} = -5$
 $\sqrt[3]{6x+18} = -\frac{5}{3}$ Cube both sides
 $6x+18 = -\frac{125}{27}$

$6x = -\frac{611}{27}$

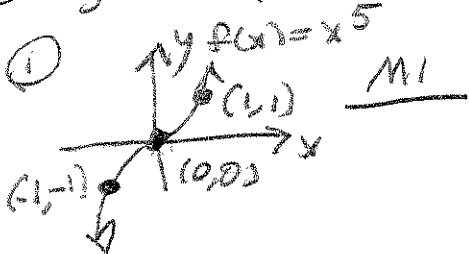
$x = -\frac{611}{162}$

$A = (-\frac{611}{162}, 0) \approx (-3.771605, 0)$

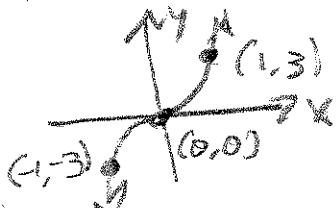
⑤ $g(x) = -3\sqrt[3]{6x+18} + 5$



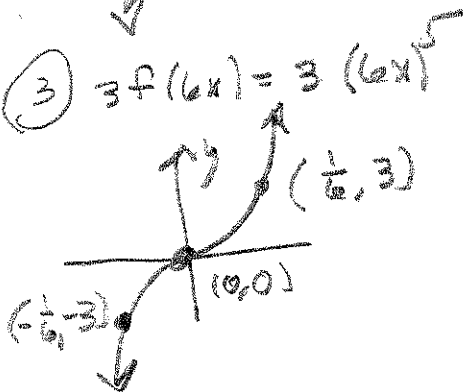
(5) $g(x) = 3(6x+18)^5 - 5$



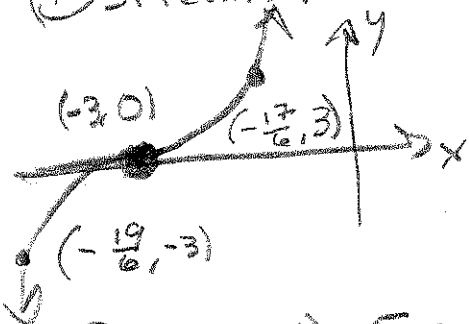
(2) $3f(x) = 3x^5$



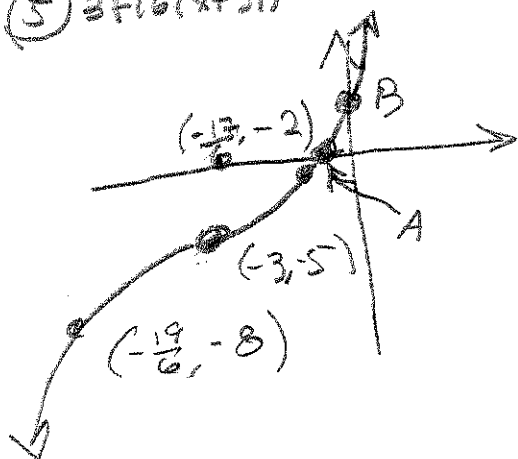
(3) $3f(6x) = 3(6x)^5$



(4) $3f(6(x+3)) = 3(6(x+3))^5$

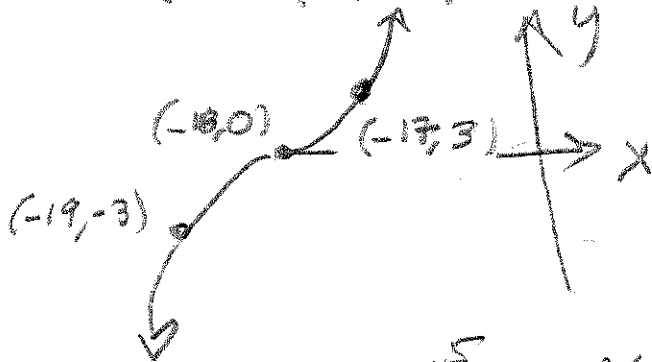


(5) $3f(6(x+3)) - 5 = 3(6(x+3))^5 - 5$

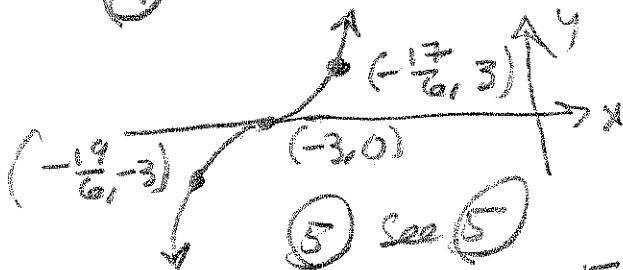


M2 (1) See (1), (2) See (2)

(3) $3(x+18)^5$



(4) $3(6x+18)^5 = 3f(6x+18)$



(5) See (5)

y-int: $g(0) = 3(18)^5 - 5 = 5668649$

$B = (5668649, 0)$

x-int: $g(x) = 0$

$3(6x+18)^5 - 5 = 0$

$3(6x+18)^5 = 5$

$(6x+18)^5 = \frac{5}{3}$

$((6x+18)^5)^{1/5} = (\frac{5}{3})^{1/5} = \frac{\sqrt[5]{5}}{\sqrt[5]{3}}$

$= \frac{(\sqrt[5]{5})(\sqrt[5]{3^4})}{(\sqrt[5]{3})(\sqrt[5]{3^4})} = \frac{\sqrt[5]{405}}{3}$

$6x+18 = \frac{\sqrt[5]{405}}{3}$

$6x = \frac{54 + \sqrt[5]{405}}{3}$

$x = \frac{54 + \sqrt[5]{405}}{18} \approx$

$A = (\frac{54 + \sqrt[5]{405}}{18}, 0)$
 $\approx (-2.815406, 0)$

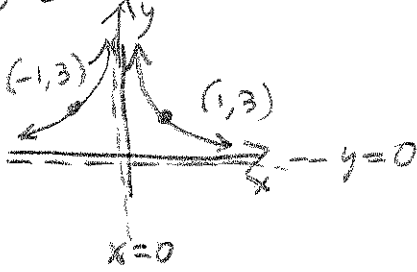
121 WP #2

⑥ $g(x) = 3\left(\frac{1}{6x+18}\right)^2 - 5$

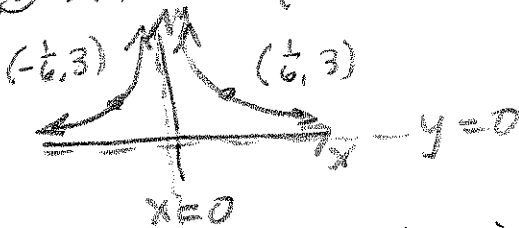
① $f(x) = \frac{1}{x^2} = 3\left(\frac{1}{(6x+18)^2}\right) - 5$



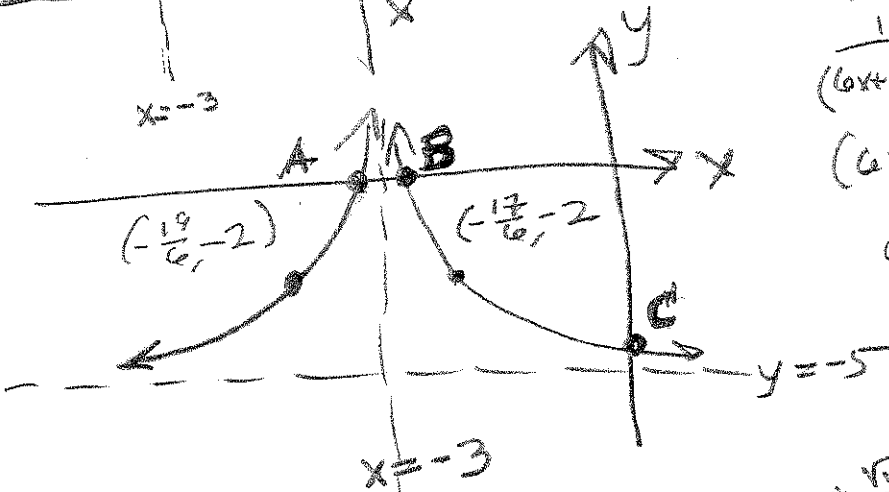
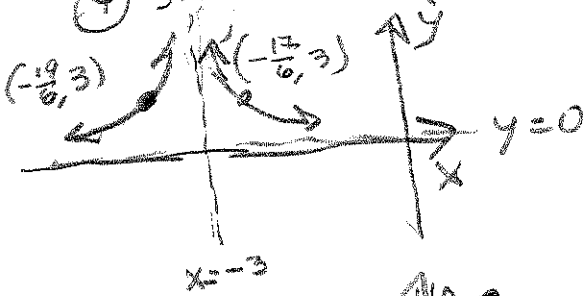
② $3f(x) = 3\left(\frac{1}{x^2}\right)$



③ $3f(6x) = 3\left(\frac{1}{(6x)^2}\right)$

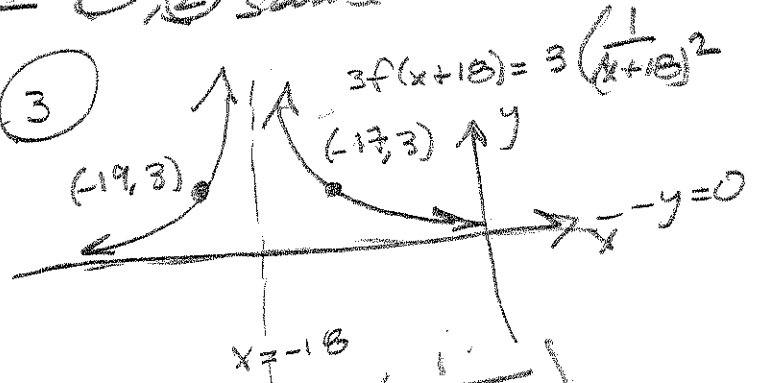


④ $3f(6(x+3)) = 3\left(\frac{1}{(6(x+3))^2}\right)$

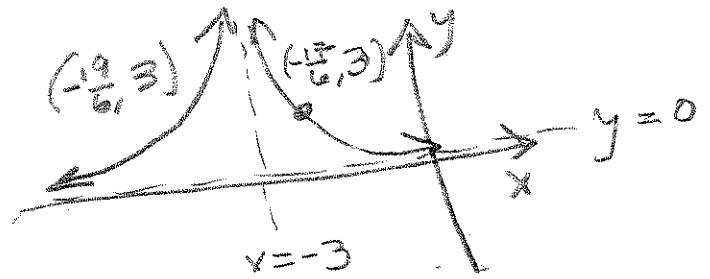


M2 ①, ② same

③



④ $f(6x+18) = 3\left(\frac{1}{(6x+18)^2}\right)$



⑤ same.

$y = \text{int } g(0) = 3\left(\frac{1}{18}\right)^2 - 5$
 $= \frac{3}{324} - 5 = \frac{1}{108} - \frac{540}{108} = -\frac{539}{108}$

$C = (0, -\frac{539}{108}) = (0, -4.99074)$

$x \rightarrow \text{int } g(x) = 0$

$3\left(\frac{1}{(6x+18)^2}\right) - 5 = 0$

$3\frac{1}{(6x+18)^2} = 5$

$\frac{1}{(6x+18)^2} = \frac{5}{3}$

$(6x+18)^2 = \frac{3}{5}$

$6x+18 = \pm\sqrt{\frac{3}{5}} = \pm\frac{\sqrt{3}}{\sqrt{5}}$

$= \pm\frac{\sqrt{15}}{5}$

$6x = -18 \pm \frac{\sqrt{15}}{5}$

$x = -3 \pm \frac{\sqrt{15}}{30}$

$A = \left(\frac{-90 - \sqrt{15}}{30}, 0\right)$

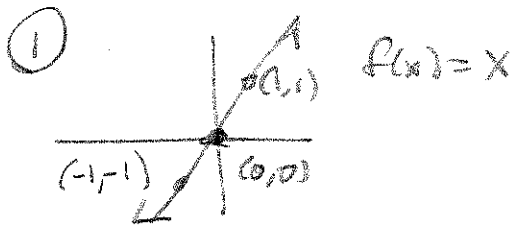
$B = \left(\frac{-90 + \sqrt{15}}{30}, 0\right)$

$A \approx (-3.129, 0)$
 $B \approx (-2.871, 0)$

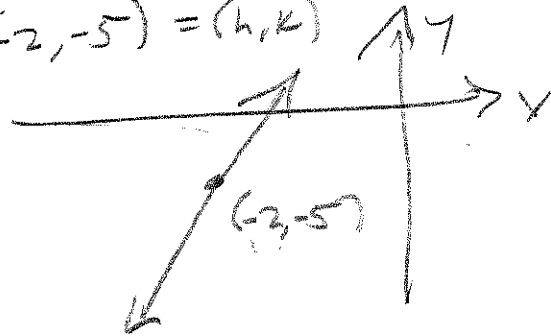
WP #2

⑦ $g(x) = 7(x+2) - 5$

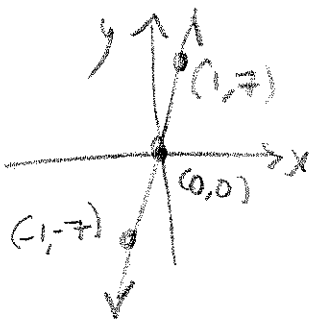
New method:



$7(x+2) - 5$ is a line
w/ slope $m = 7$, thru
 $(-2, -5) = (h, k)$



② $7x = 7f(x)$ By trans-
formations



y-int: $g(0) = 7(2) - 5$

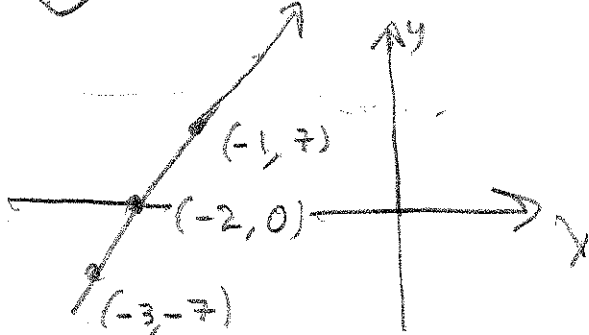
$= 9$
 $B = (0, 9)$

x-int: $g(x) = 0$
 $7(x+2) - 5 = 0$
 $7x + 14 - 5 = 0$
 $7x + 9 = 0$

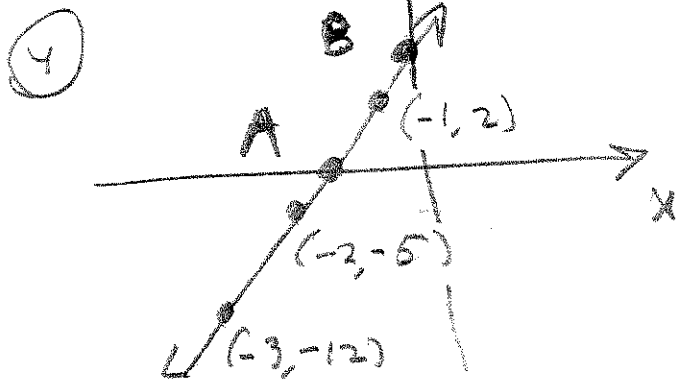
$7x = -9$

$x = -\frac{9}{7}$

③ $7(x+2) = 7f(x+2)$



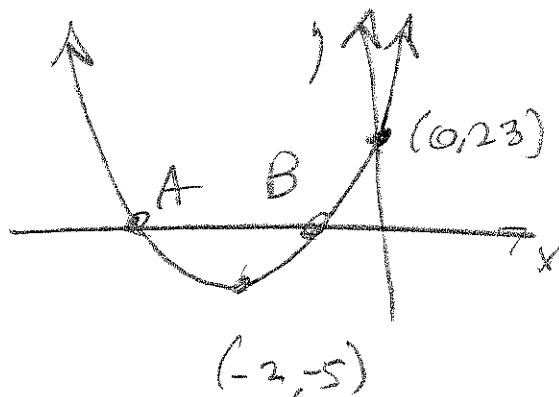
A =



$A = (-\frac{9}{7}, 0)$

121 WP #2

⑧ $g(x) = 7(x+2)^2 - 5$
(h, k) = (-2, -5)



Use $g(0)$ to generally locate x- & y-axes

$$g(0) = 7(2)^2 - 5 \\ = 28 - 5 = 23 \\ (0, 23)$$

$$7(x+2)^2 - 5 = 0$$

$$7(x+2)^2 = 5$$

$$(x+2)^2 = \frac{5}{7}$$

$$x+2 = \pm \sqrt{\frac{5}{7}} = \pm \frac{\sqrt{5}}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \pm \frac{\sqrt{35}}{7}$$

$$x = -2 \pm \frac{\sqrt{35}}{7}$$

$$A = \left(-2 - \frac{\sqrt{35}}{7}, 0\right) \approx (-1.154845745, 0)$$

$$B = \left(-2 + \frac{\sqrt{35}}{7}, 0\right) \approx (-2.845154255, 0)$$

121 WP #2

$$\frac{y-uit}{g(0)} = 1 \rightarrow (0,1)$$

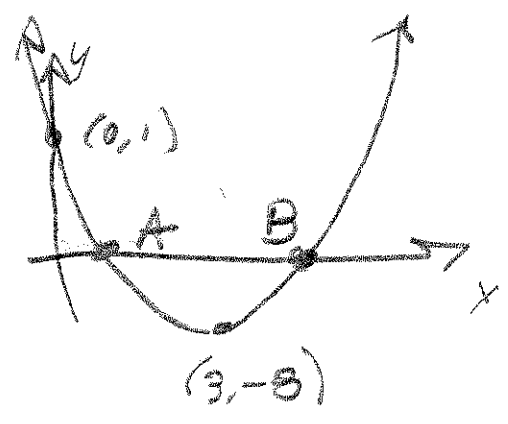
9

$$g(x) = x^2 - 6x + 1$$

$$= x^2 - 6x + 3^2 - 9 + 1$$

$$= (x-3)^2 - 8$$

$$(h,k) = (3, -8)$$



$$\frac{x-uit}{g}$$

$$(x-3)^2 - 8 = 0$$

$$(x-3)^2 = 8$$

$$\sqrt{(x-3)^2} = \sqrt{8} = \sqrt{2 \cdot 2 \cdot 2} = 2\sqrt{2}$$

$$|x-3| = 2\sqrt{2}$$

$$x-3 = \pm 2\sqrt{2}$$

$$x = 3 \pm 2\sqrt{2}$$

$A = (3 - 2\sqrt{2}, 0)$	$\approx (0.1715728753, 0)$
$B = (3 + 2\sqrt{2}, 0)$	$\approx (5.828427125, 0)$

$$(10) \quad g(x) = 3x^2 - 30x + 71$$

$$= 3(x^2 - 10x + 5^2) + 71 - 3(25)$$

$$\frac{10}{2} = 5 \rightarrow 5^2$$

$$= 3(x-5)^2 - 4$$

$$(h, k) = (5, -4)$$

$$g(0) = 71$$

$$(0, 71) \quad y\text{-int}$$

$$g(x) = 0$$

$$3(x-5)^2 - 4 = 0$$

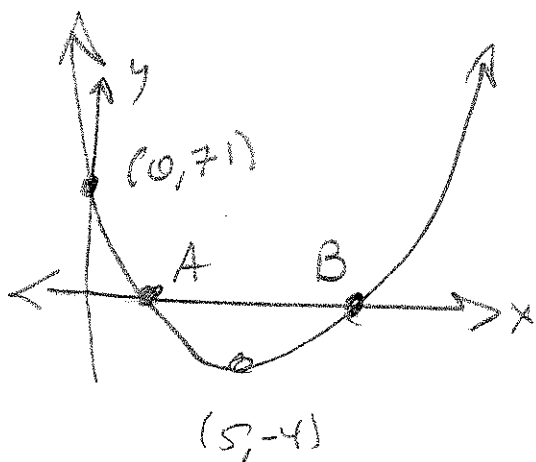
$$3(x-5)^2 = 4$$

$$(x-5)^2 = \frac{4}{3}$$

$$x-5 = \pm \sqrt{\frac{4}{3}} = \pm \frac{\sqrt{4}}{\sqrt{3}} = \pm \frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$$

$$= \pm \frac{2\sqrt{3}}{3}$$

$$x = 5 \pm \frac{2\sqrt{3}}{3}$$



ALTERNATE

$$a = 3, b = -30, c = 71$$

$$-\frac{b}{2a} = -\frac{-30}{2(3)} = 5 = h$$

$$(h, k) = (5, -4)$$

$$g(5) = 3(5)^2 - 30(5) + 71$$

$$= 3(25) - 150 + 71$$

$$= 75 + 71 - 150$$

$$= 146 - 150 = -4 = k$$