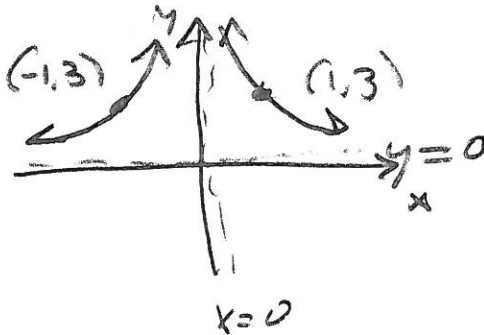
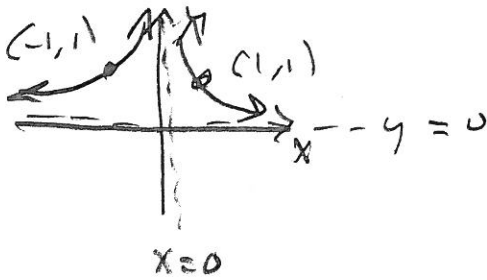


WRITING PROJECT #2
Spring, 2020

① $g(x) = \frac{3}{(5x-15)^2} - 6$

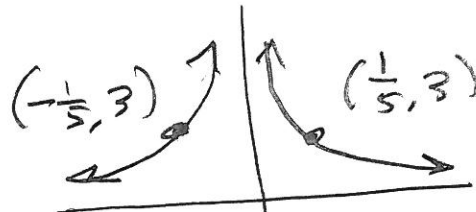
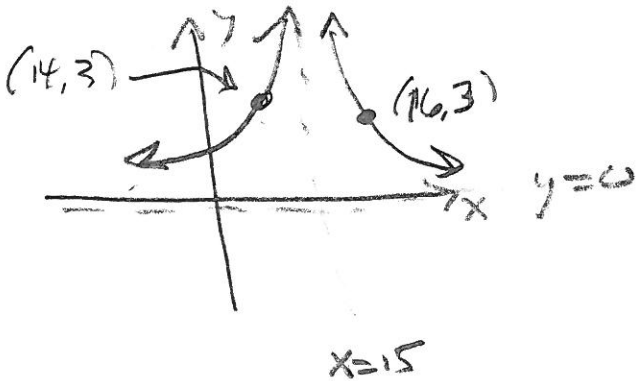
② $f(x) = \frac{1}{x^2}$

① $3f(x) = \frac{3}{x^2}$



② (M1) $3f(x-15) = \frac{3}{(x-15)^2}$

② (M2) $3f(5x) = \frac{3}{(5x)^2}$



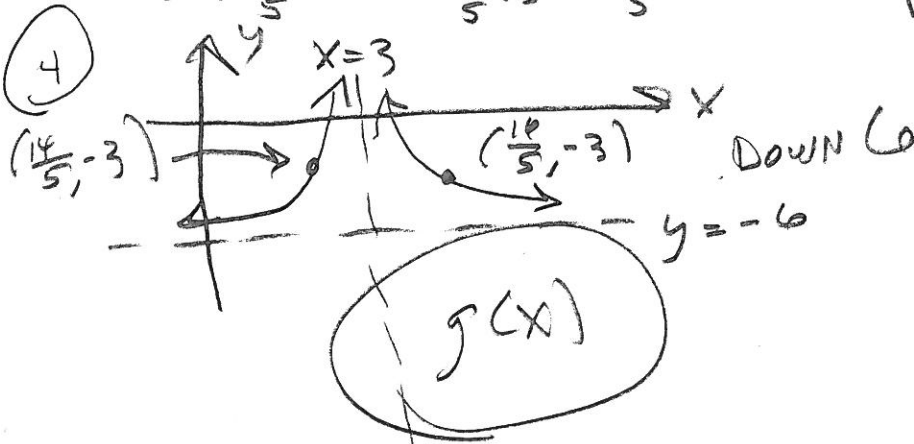
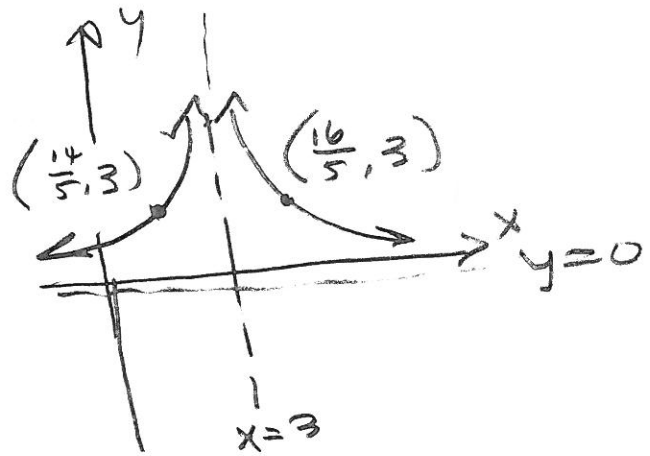
③ $3f(5x-15) = 3f(5(x-3))$

$x \mapsto \frac{1}{5}x$

$x \mapsto x+3$

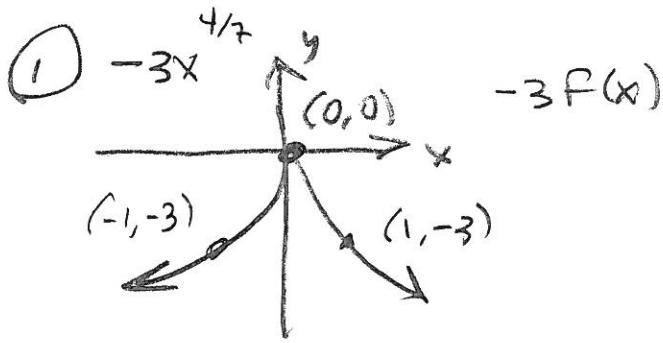
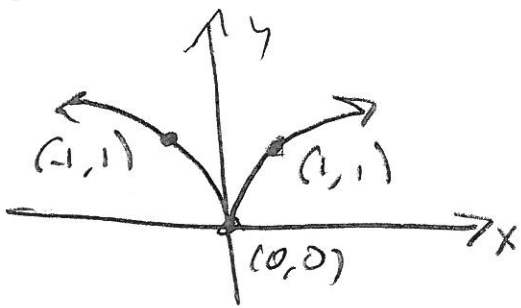
(M1) $14 \mapsto \frac{14}{5}$
 $16 \mapsto \frac{16}{5}$

(M2) $-\frac{1}{5} + 3 = \frac{14}{5}$
 $\frac{1}{5} + 3 = \frac{16}{5}$

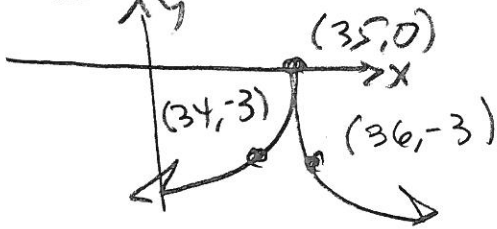


(2) $g(x) = -3(7x-35)^{4/7} + 4$

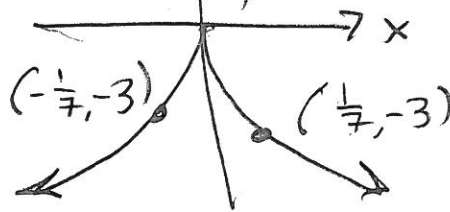
(0) $f(x) = x^{4/7}$



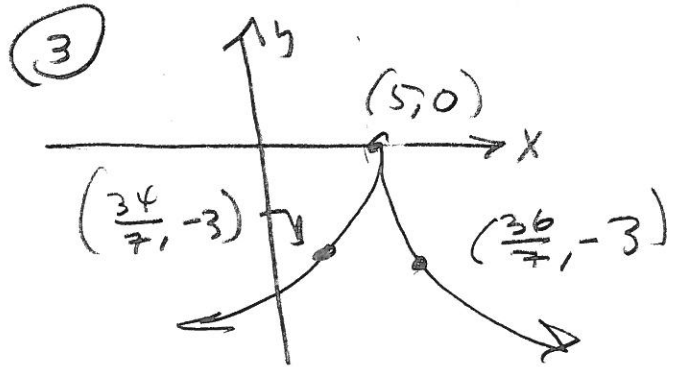
(2) (M1) $-3f(x-35)$



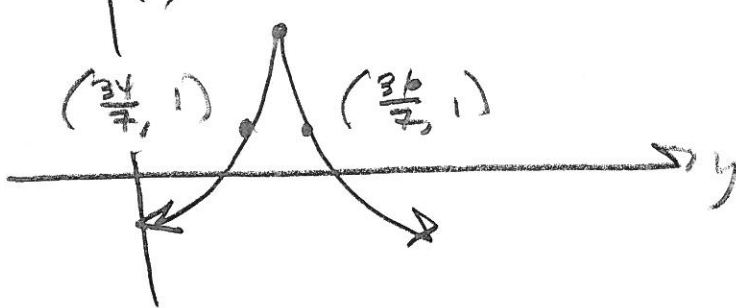
(M2) $-3f(7x)$



(3) $-3f(7x-35) = -3f(7(x-5))$
 $x \mapsto \frac{1}{7}x$ $x \mapsto x+5$

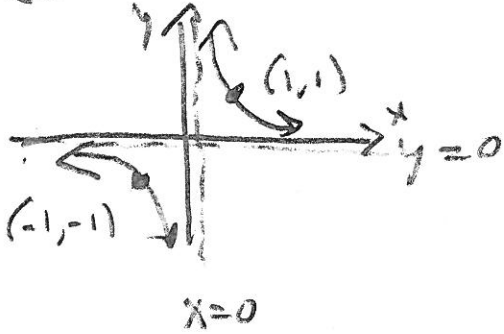


(4) $g(x)$ up 4

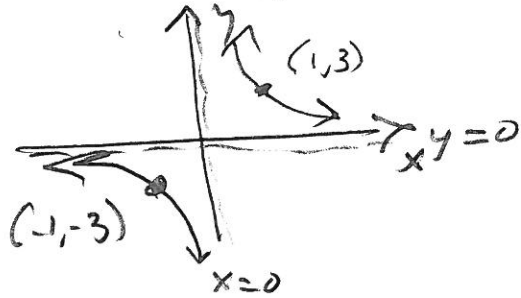


③ $g(x) = \frac{3}{(5x-15)^3} - 6$ $f(x) = \frac{1}{x^3}$ has $\frac{1}{x}$ shape.

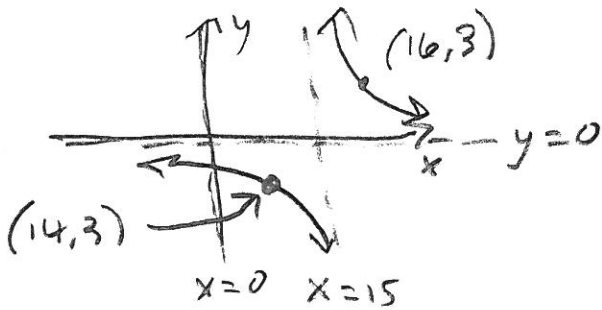
① $f(x) = \frac{1}{x^3}$



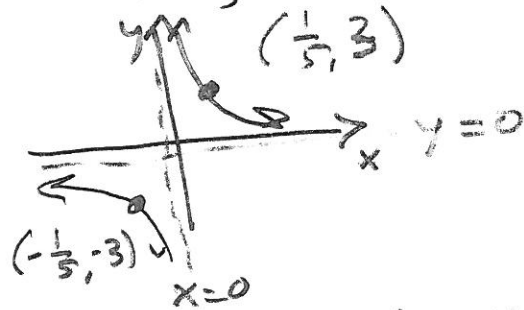
① $3f(x) = \frac{3}{x^3}$



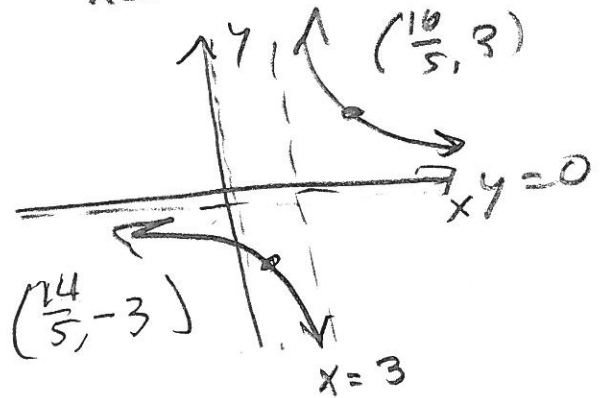
② M_1 $3f(x-15)$
 $x \mapsto x+15$



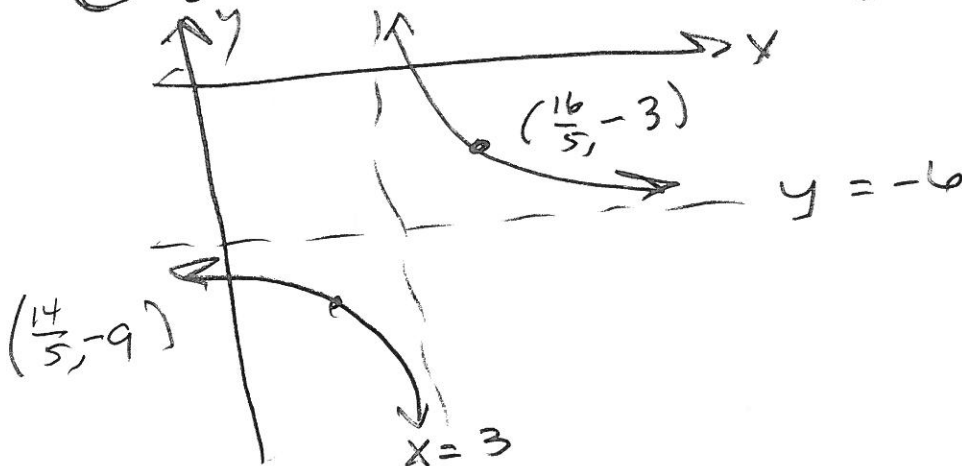
M_2 $3f(5x)$
 $x \mapsto \frac{1}{5}x$



③ $3f(5x-15) = 3f(5(x-3))$
 M_1 $x \mapsto \frac{1}{5}x$ M_2 $x \mapsto x+3$

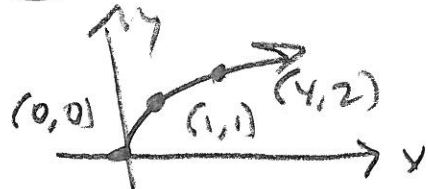


④ $g(x)$ $y \mapsto y-6$

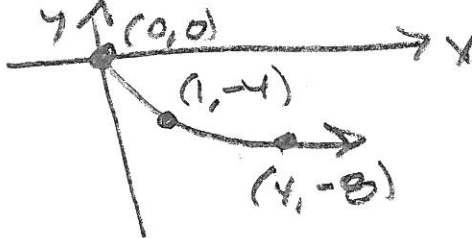


(4) $g(x) = -4\sqrt{-3x-27} + 12$ $f(x) = \sqrt{x}$ shape.

(1) $f(x) = \sqrt{x}$

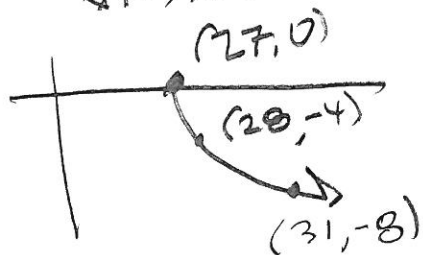


(1) $-4f(x) = -4\sqrt{x}$ $y \mapsto -4y$



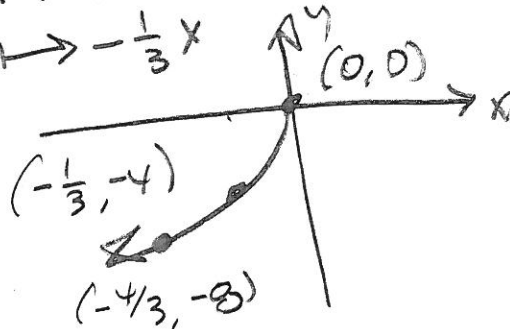
(2 M1) $-4f(x-27)$

$x \mapsto x+27$



(M2) $-4f(-3x) = -4\sqrt{-3x}$

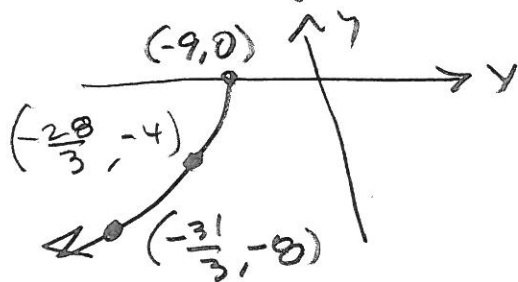
$x \mapsto -\frac{1}{3}x$



(3) $-4f(-3x-27) = -4f(-3(x+9))$

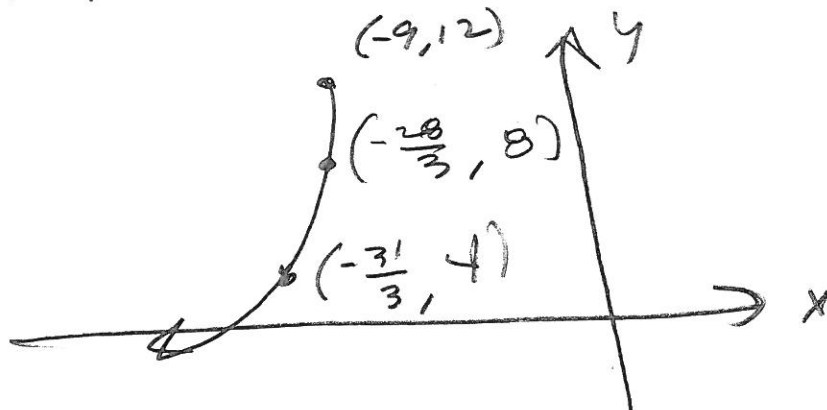
M1 $x \mapsto -\frac{1}{3}x$

M2 $x \mapsto x-9$



M1: $0-9 = -9$
 $-\frac{1}{3}-9 = -\frac{28}{3}$
 $-\frac{4}{3}-9 = -\frac{31}{3}$

(4) $g(x) = -4f(-3(x+9)) + 12$



121

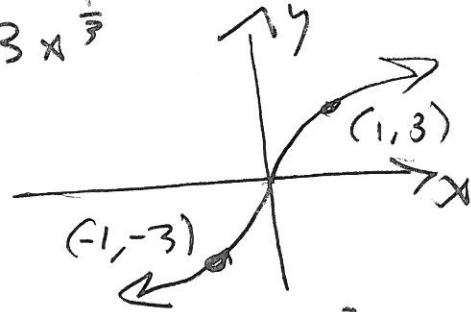
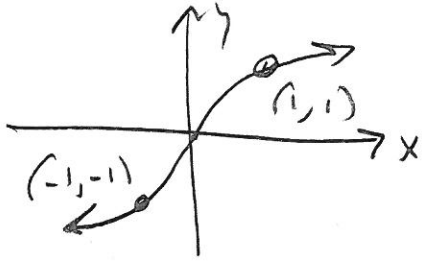
WP #2

5

5) $g(x) = 3\sqrt[3]{2x-30} - 11$ $f(x) = \sqrt[3]{x}$

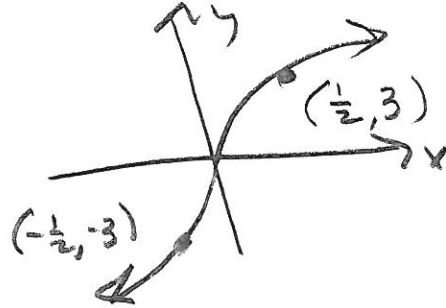
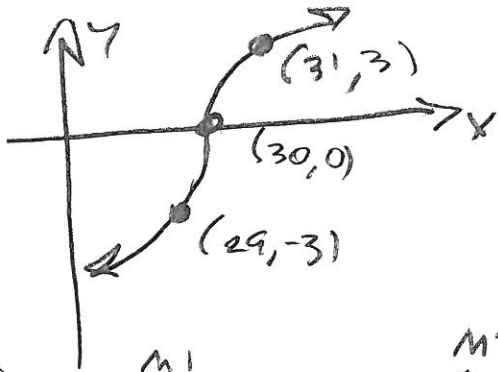
6) $f(x) = \sqrt[3]{x} = x^{\frac{1}{3}}$

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



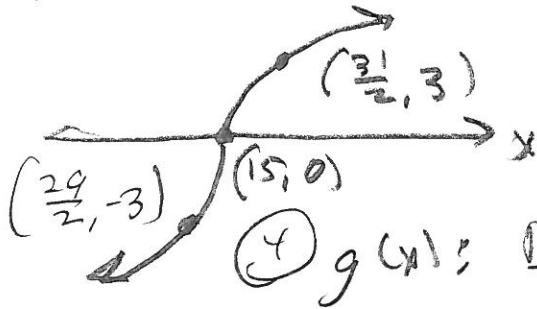
2) m1) $3f(x-30) = 3\sqrt[3]{x-30}$
 $x \mapsto x+30$

m2) $3f(2x) = 3\sqrt[3]{2x}$
 $x \mapsto \frac{1}{2}x$

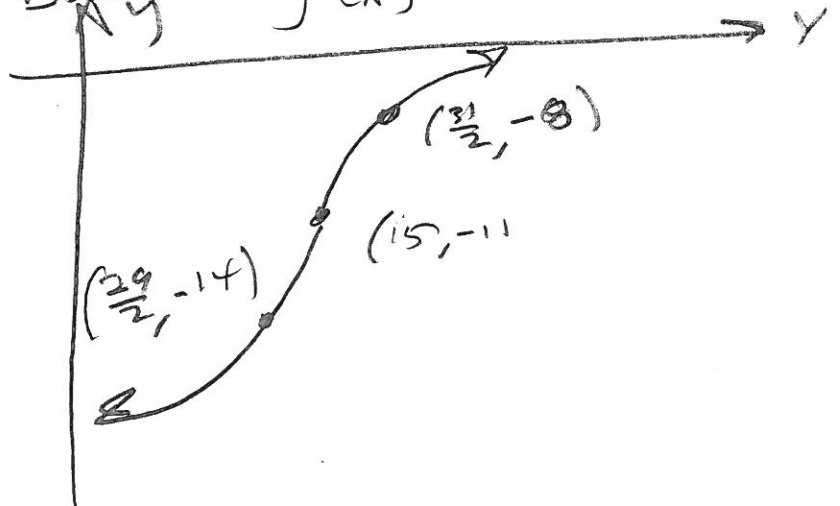


3) m1) $3f(2x-30) = 3f(2(x+15))$
 $x \mapsto \frac{1}{2}x$ $x \mapsto x+15$

m2: $-\frac{1}{2} + 15 = \frac{-1+30}{2} = \frac{29}{2}$
 $\frac{1}{2} + 15 = \frac{31}{2}$



4) $g(x)$: Down 11

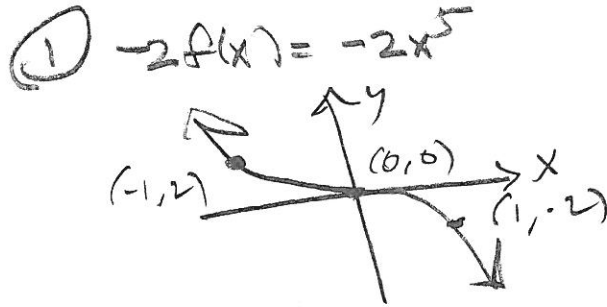
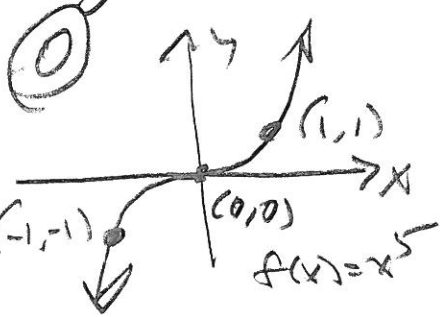


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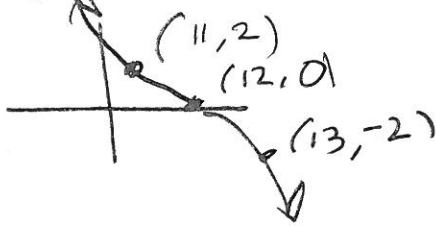
WP 2

(6)

(6) $g(x) = -2(3x-12)^5 + 9$ $f(x) = x^5$ has x^3 shape.



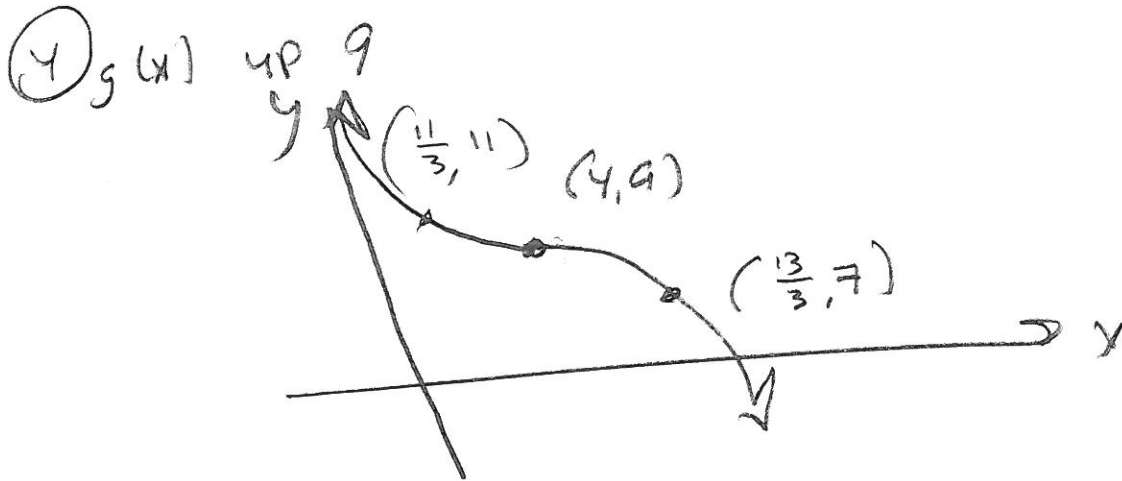
(2) $-2f(x-12)$ $x \mapsto x+12$ $M1$



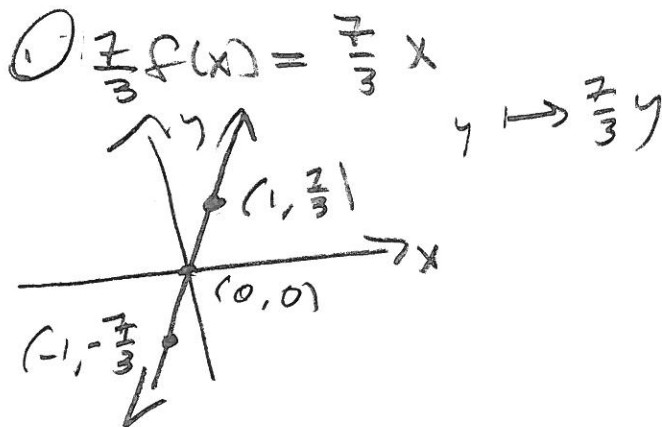
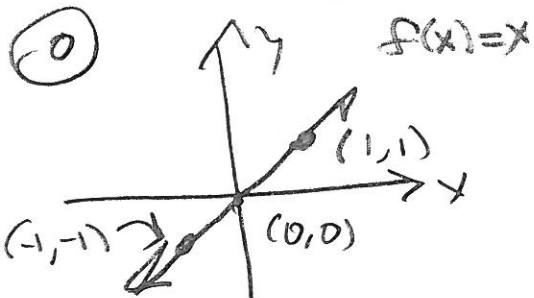
$M2$ $-2f(3x)$ $x \mapsto \frac{1}{3}x$



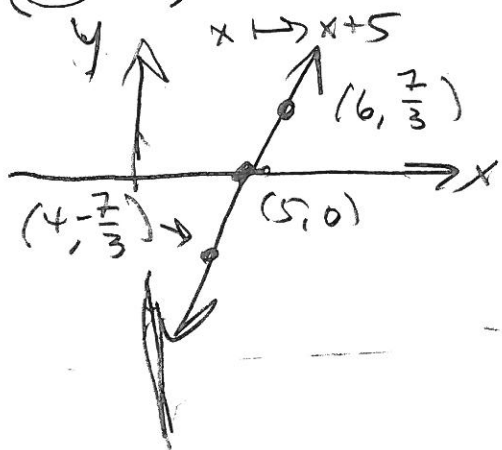
(3) $-2f(3x-12) = -2f(3(x-4))$
 $x \mapsto \frac{1}{3}x$ $M1$ $M2$ $x \mapsto x+4$



⑦ $g(x) = \frac{7}{3}(x-5) - 3$



② $\frac{7}{3}f(x-5) = \frac{7}{3}(x-5)$

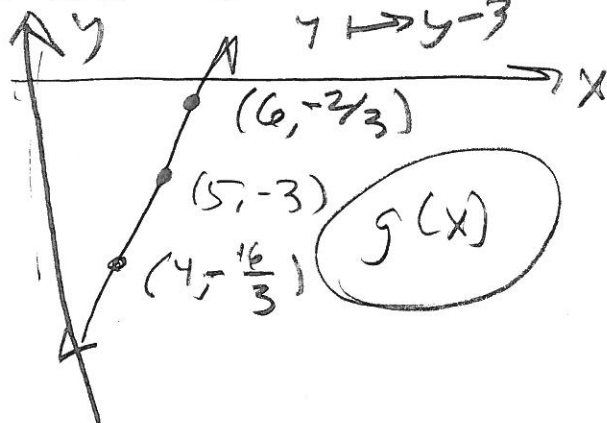


③ $\frac{7}{3}f(x-5) - 3$ Down 3

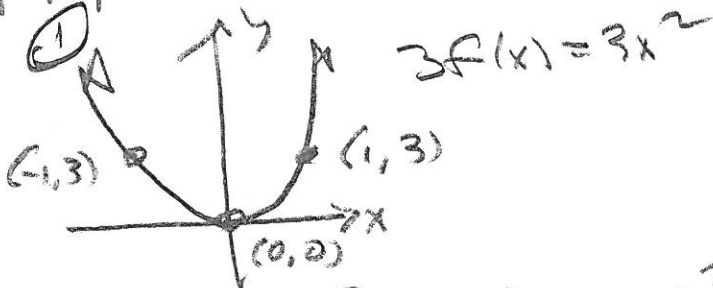
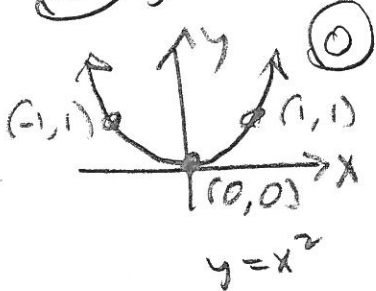
$y \mapsto y-3$

$\frac{7}{3} - \frac{9}{3} = -\frac{2}{3}$

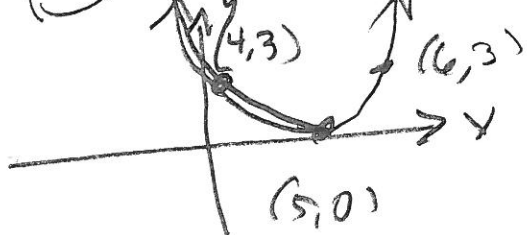
$-\frac{2-9}{3} = -\frac{16}{3}$



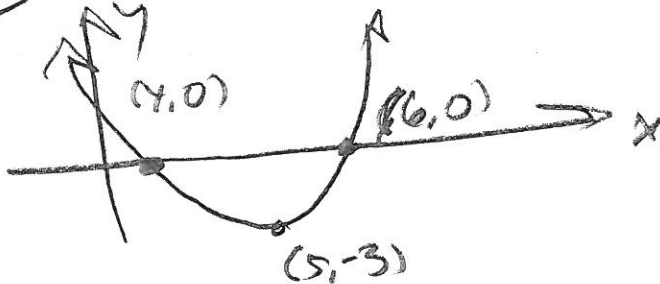
⑧ $g(x) = 3(x-5)^2 + 4$



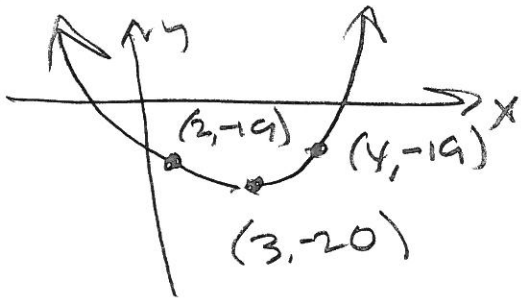
② $3f(x-5) = 3(x-5)^2$



③ $g(x)$ Down 3



$$\textcircled{9} \quad g(x) = x^2 - 6x - 11 = x^2 - 6x + 3^2 - 9 - 11 = (x-3)^2 - 20$$



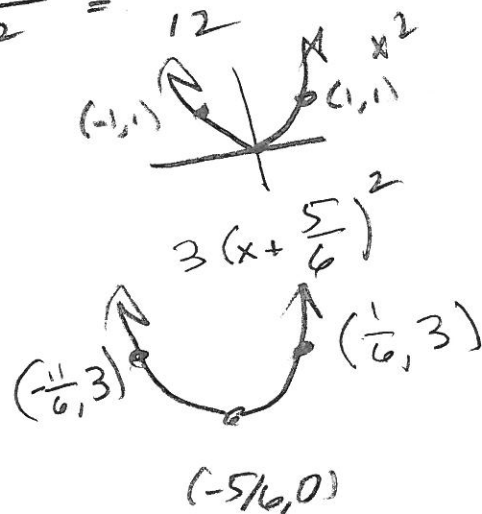
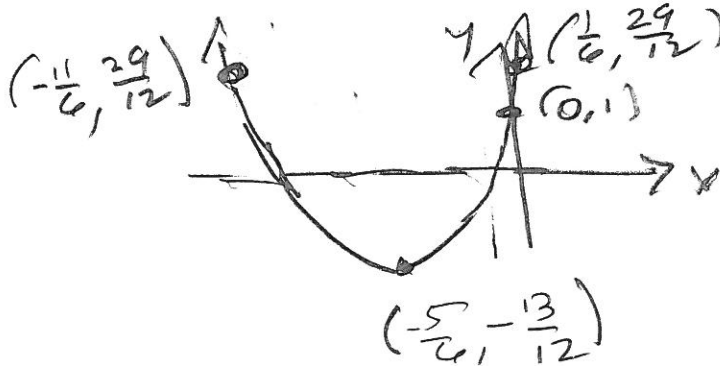
$$\textcircled{10} \quad g(x) = 3x^2 + 5x + 1$$

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

$$= 3\left(x^2 + \frac{5}{3}x + \left(\frac{5}{6}\right)^2\right) + 1 - 3\left(\frac{25}{36}\right)$$

$$= \boxed{3\left(x + \frac{5}{6}\right)^2 - \frac{13}{12}}$$

$$1 - 3\left(\frac{25}{36}\right) = 1 - \frac{25}{12} = \frac{12-25}{12} = -\frac{13}{12}$$



$$3 - \frac{13}{12} = \frac{36-13}{12} = \frac{29}{12}$$