$\frac{1}{\sqrt{3}} \cdot 3 = \sqrt{3}$

$\frac{1}{\sqrt{3}} \cdot \frac{(\sqrt{3})^2}{1} = \sqrt{3}$

4.3

⑤ $y = x\sqrt{8-x^2} = \underset{f}{x}\,\underset{g}{(8-x^2)^{1/2}}$

$g'(x)$

$(8-x^2)^{1/2} + \frac{1}{2}(8-x^2)^{-\frac{1}{2}}[-2x] \cdot x = 0$

$(8-x^2)^{1/2} + \frac{-x^2}{(8-x^2)^{\frac{1}{2}}} = 0$

$\frac{1}{(8-x^2)^{\frac{1}{2}}}\left[(8-x^2) - x^2\right] = 0$

$\frac{1}{(8-x^2)^{\frac{1}{2}}} = 0$

$\left[(8-x^2)^{\frac{1}{2}}\right]^2 \neq [0]^2$

$8 - x^2 \neq 0$

$8 \neq x^2$

$\pm\sqrt{8} \neq x$

$8 - x^2 - x^2 = 0$

$8 - 2x^2 = 0$

$8 = 2x^2$

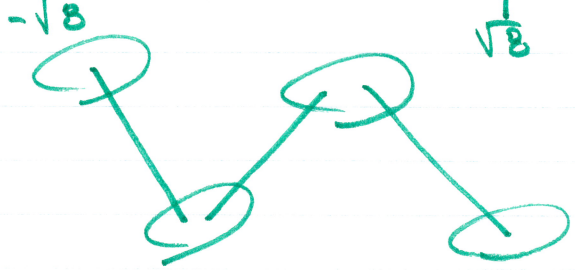
$4 = x^2$

$\pm 2 = x$

DECR.	INCR.	DECR.
−	+	−
-2.5	0	2.3

-2 $\quad$ 2

$-\sqrt{8}$ $\quad$ $\sqrt{8}$

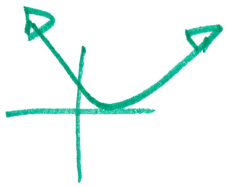


$y(-\sqrt{8}) = 0$

$y(-2) = -4$

$y(2) = 4$

$y(\sqrt{8}) = 0$



4.3 f g

(39) $y' = (x-1)^2(x-2) = 0$

$x = 1, 2$

FDT

DECR	DECR	INCR
−	−	+
0	1.5	2
1		2

$y'' = 2(x-1)(x-2) + (x-1)^2$

$= (x-1)\left[2(x-2) + (x-1)\right] = 0$

$x - 1 = 0$ $\qquad 2(x-2) + (x-1) = 0$

$x = 1$ $\qquad 2x - 4 + x - 1 = 0$

$3x - 5 = 0$

$3x = 5$

$x = \frac{5}{3}$

CT

UP	DOWN	UP
5	$-\frac{1}{3}$	1
0	$\frac{4}{3}$	2
1	$\frac{5}{3}$	

(17) $y = x^{1/3}(x-4) = x^{4/3} - 4x^{1/3}$

$y' = \frac{4}{3}x^{1/3} - \frac{4}{3}x^{-2/3}$

$y'' = \frac{4}{9}x^{-2/3} + \frac{8}{9}x^{-5/3} = 0$

$x \neq 0$

$\frac{4}{9}x^{-5/3}(x + 2) = 0$

$\frac{4}{9\sqrt[3]{x^5}} = 0$ $\qquad x + 2 = 0$

$x = -2$

$\frac{4}{9\sqrt[3]{x^2}} + \frac{8}{9\sqrt[3]{x^5}}$

UP	DOWN	UP
+	−	+
−3	−1	1
−2	0	

4.3

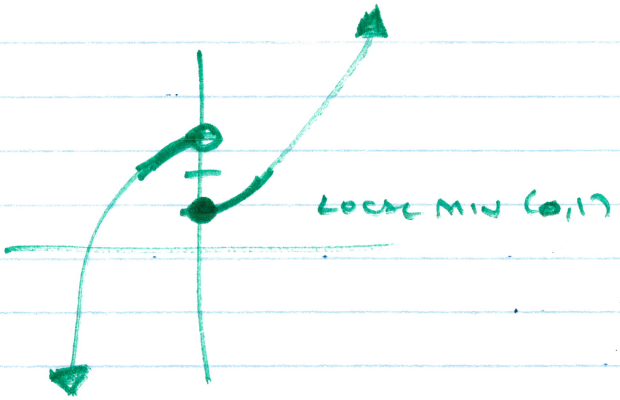
⑥ $y = \begin{cases} 3 - x^2, & x < 0 \\ x^2 + 1, & x \geq 0 \end{cases}$

$y = \begin{cases} -2x + 1, & x < 0 \\ 2x + 1, & x > 0 \end{cases}$

$y' = \begin{cases} -2x, & x < 0 \\ 2x, & x \geq 0 \end{cases}$

INCR	INCR
2	2
-1	1

0



4.3 f g

(39) $y' = (x-1)^2(x-2) = 0$

$x = 1, 2$

FDT

DECR.	DECR.	INCR.
−	−	+
0	$\frac{3}{2}$	3

1 2

LOCAL MIN @ $x = 2$

$y'' = 2(x-1)(x-2) + (x-1)^2 = 0$

$(x-1)[2(x-2) + (x-1)] = 0$

$x - 1 = 0$ $\quad 2x - 4 + x - 1 = 0$

$x = 1$ $\quad 3x - 5 = 0$

$x = \frac{5}{3}$

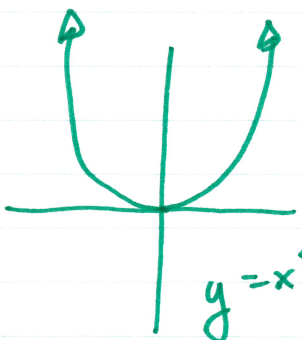
CT $\quad (x-1)(3x-5)$

UP	DOWN	UP
+	−	+
0	$\frac{4}{3}$	2

1 $\frac{5}{3}$

INFL. PT. @ $x = 1, \frac{5}{3}$

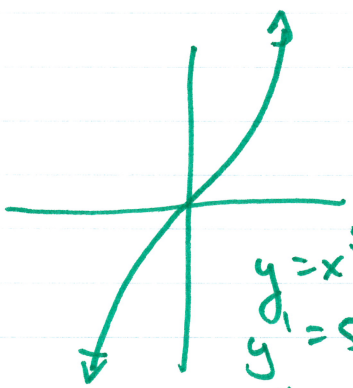
(43)



$y = x^4$

$y' = 4x^3$

$y'' = 12x^2$

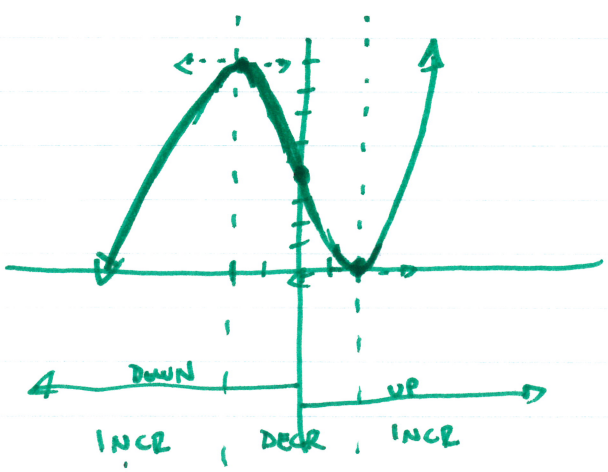


$y = x^5$

$y' = 5x^4$

$y'' = 20x^3$

(47)



4.3

(51) (c)