1.3 #80

$1 + 1000y^3 =$

$1 + (10y)^3 = (1 + 10y)(1 - 10y + (10y)^2)$

$\quad\quad\quad\quad = \underline{(1 + 10y)(1 - 10y + 100y^2)}$

1.4 #12

$\dfrac{\sqrt{2x}}{x+1}$ $\quad 2x \geq 0, \quad x+1 \neq 0$

$\quad\quad\quad\quad x \geq 0, \quad x \neq -1$

$\quad\quad$ so, Domain is $\underline{\{x \mid x \geq 0\}}$

#20

$\dfrac{y^2 - 3y - 18}{2y^2 + 5y + 3} = \dfrac{(y-6)(y+3)}{(2y+3)(y+1)}$

#24

$\dfrac{x^2 - 25}{x^2 - 16} \cdot \dfrac{x+4}{x+5} = \dfrac{(x-5)(x+5)}{(x+4)(x-4)} \cdot \dfrac{x+4}{x+5} = \dfrac{x-5}{x-4}$

#32

$\dfrac{2x+1}{2x^2 + x - 15} \div \dfrac{6x^2 - x - 2}{x+3} = \dfrac{2x+1}{(2x-5)(x+3)} \cdot \dfrac{x+3}{(2x+1)(3x-2)} = \dfrac{1}{(2x-5)(3x-2)}$

#46

$\dfrac{5}{2x-3} - \dfrac{3}{(2x-3)^2} = \dfrac{5(2x-3)}{(2x-3)^2} - \dfrac{3}{(2x-3)^2} = \dfrac{10x - 18}{(2x-3)^2} = \dfrac{2(5x-9)}{(2x-3)^2}$

#60

$\dfrac{1 + \frac{1}{c-1}}{1 - \frac{1}{c-1}} = \dfrac{c-1+1}{c-1-1} \cdot \dfrac{c}{c-2} \Rightarrow \dfrac{\frac{c-1}{c-1} + \frac{1}{c-1}}{\frac{c-1}{c-1} - \frac{1}{c-1}} = \dfrac{c-1+1}{c-1} \cdot \dfrac{c-1}{c-1-1}$

#70

rationalize the numerator!

$\dfrac{\frac{1}{\sqrt{x+h}} - \frac{1}{\sqrt{x}}}{h} = \left[\dfrac{\sqrt{x}}{\sqrt{x}\sqrt{x+h}} - \dfrac{\sqrt{x+h}}{\sqrt{x}\sqrt{x+h}} \right] \cdot \dfrac{1}{h} = \dfrac{\sqrt{x} - \sqrt{x+h}}{h\sqrt{x}(x+h)} \cdot \dfrac{\sqrt{x} + \sqrt{x+h}}{\sqrt{x} + \sqrt{x+h}} = \cdots$

$\cdots = \dfrac{x - (x+h)}{h\sqrt{x}\sqrt{x+h}\,(\sqrt{x} + \sqrt{x+h})} = -\dfrac{1}{\sqrt{x}\sqrt{x+h}\,(\sqrt{x} + \sqrt{x+h})}$

#86

$$\frac{2(x-y)}{\sqrt{x}-\sqrt{y}} = \frac{2(x-y)}{\sqrt{x}-\sqrt{y}} \cdot \frac{\sqrt{x}+\sqrt{y}}{\sqrt{x}+\sqrt{y}} = \frac{2(x-y)(\sqrt{x}+\sqrt{y})}{x-y} = 2\sqrt{x}+2\sqrt{y}$$

#102

a) The average cost $A = \dfrac{Cost}{\# \ of \ shirts} = \dfrac{500+6x+0.01x^2}{x}$

b)

X	10	20	50	100	200	500	1000
Average	$56.10	$31.20	$16.50	$12.00	$10.50	$12.00	$16.50