1a) 1 6 15

$$1(2)^6 + 6(2)^5\left(\frac{x}{2}\right) + 15(2)^4\left(\frac{x}{2}\right)^2$$

$$64 + 96x + 60x^2$$

b) $\left(2 + \frac{x}{2}\right)^6 = 2.05^6$

$$2 + \frac{x}{2} = 2.05$$

$$\frac{x}{2} = 0.05$$

$$x = 0.1$$

$$64 + 96(0.1) + 60(0.1)^2$$

$$= \underline{\underline{74.2}}$$

2a) $\left(2 - \frac{x}{8}\right)^7$

1 , 7, 21

$1(2)^7 + 7(2)^6\left(\frac{-x}{8}\right) + 21(2)^5\left(\frac{-x}{8}\right)^2$

$128 - 56x + \frac{21}{2}x^2$

b) $(ax+b)(128 - 56x + \frac{21}{2}x^2)$

$128ax + 128b - 56ax^2 - 56bx \ldots$

$128b + (128a - 56b)x \ldots$

$128b = 384$

$b = 3$

$128a - 56(3) = -104$

$128a = 64$

$a = \frac{1}{2}$

3a) $(p+q)^5$ 1 5 10 10 5 1

$p^5 + 5p^4q + 10p^3q^2 + 10p^2q^3 + 5pq^4 + q^5$

b) p = late q = not late

$= 0.1$ $= 0.9$

$5(0.1)(0.9)^4 + (0.9)^5$

$= 0.91854$

4a $(1 + 4x)^8$ 1 8 28 56

$(1)^8 + 8(1)^7(4x) + 28(1)^6(4x)^2 + 56(1)^5(4x)^3$

$1 + 32x + 448x^2 + 3584x^3$

b/ $(1 + 4x)^8 = 1.04^8$

$1 + 4x = 1.04$

$4x = 0.04$

$x = 0.01$

$1 + 32(0.01) + 448(0.01)^2 + 3584(0.01)^3$

$= 1.3684$

5a) $(2 + kx)^6$ 1 6 15 20

$(2)^6 + 6(2)^5(kx) + 15(2)^4(kx)^2 + 20(2)^3(kx)^3$

$64 + 192kx + 240k^2x^2 + 160k^3x^3$

b) $160k^3 = -20$

$k^3 = -\frac{1}{8}$

$k = -\frac{1}{2}$

6a) $(1-2x)^5$ 1 5 10

$(1)^5 + 5(1)^4(-2x) + 10(1)^3(-2x)^2$

$1 - 10x + 40x^2$

b) $(1+x)(1-10x+40x^2)$

$1 - 10x + 40x^2 + x - 10x^2 + 40x^3$

$1 - 9x + 30x^2$