

$$1) 6667^2 - 3333^2 = (6667+3333) \times (6667-3333) \\ = 3334$$

$$2) \frac{dy}{dx} = 4x^3 \\ m = 4x - 2^3 = -32$$

$$y - y_1 = m(x - x_1)$$

$$y - 16 = -32(x - -2)$$

$$y = -32x - 48$$

$$3) \frac{2 \log 125}{3 \log 25} = \frac{2(3 \log 5)}{3(2 \log 5)} = 1$$

$$4) i) 1+5 \text{ or } 2+4 \text{ or } 3+3 \text{ or } 4+2 \\ \text{or } 5+1$$

$$\frac{5}{36}$$

$$ii) 1+6 \text{ or } 2+5 \text{ or } 3+4 \text{ or } 4+3 \\ \text{or } 5+2 \text{ or } 6+1$$

$$\frac{6}{36} = 1/6$$

$$5) \binom{5}{0} 2^5 x^0 + \binom{5}{1} 2^4 x^1 + \binom{5}{2} 2^3 x^2 \\ + \binom{5}{3} 2^2 x^3 = 32 + 80x + 80x^2 + 40x^3$$