



a) find the equation of the tangent to $y = e^{2x}$ at the point $(0, 1)$ $\frac{dy}{dx} = 2e^{2x}$.

equation of tangent = $y - y_1 = m(x - x_1)$

$(0, 1)$

$$y - 1 = 2(x - 0)$$

$$y - 1 = 2x$$

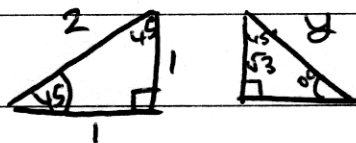
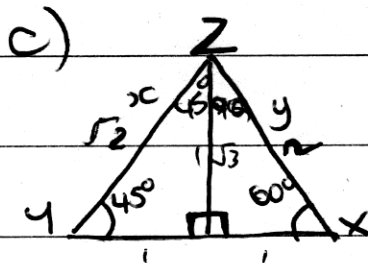
$$2x - y - 1 = 0.$$

b) differentiate

i) $x \sin x$.

$$x \cos x + x \sin x.$$

~~answer~~



$$y = 2$$

$$x = 2$$

$$x/y = \frac{2}{2} = 1$$

In the diagram, $\triangle XYZ$

is a triangle where $\angle ZYX = 45^\circ$

and $\angle ZXY = 60^\circ$

find the exact value of for
the ratio x/y .



d) find:

$$i) \int \cos 3x \, dx$$

$$= \frac{1}{3} \sin 3x + C$$

$$ii) \int_0^1 (e^{5x} - 1) \, dx$$

$$\left[\frac{e^{5x}}{5} - x \right]_0^1$$

$$= \frac{e^5 - 1}{5} - 1 \approx 146.4 \text{ ???}$$