Subham Sahoo
Teacher: Mr. Wit
Section 123

1.1) ***A)*** *Find the sum of 34 and 126 using a calculator.*

$$34 + 126 = \boxed{160}$$

B) *Find the sum using long additon.*

$$\begin{array}{cccc} & & 1 & \\ & & 3 & 4 \\ + & 1 & 2 & 6 \\ \hline & 1 & 6 & 0 \end{array}$$

1.2) *Evaluate the following definite integral:*

$$\int_0^3 \frac{2x}{\sqrt{x^2+4}} dx$$

$$u = x^2 + 4 \quad du = 2xdx$$

$$\Rightarrow \quad \int_{0^2+4}^{3^2+4} \frac{1}{\sqrt{u}} du = 2\sqrt{u}\Big|_4^{13}$$

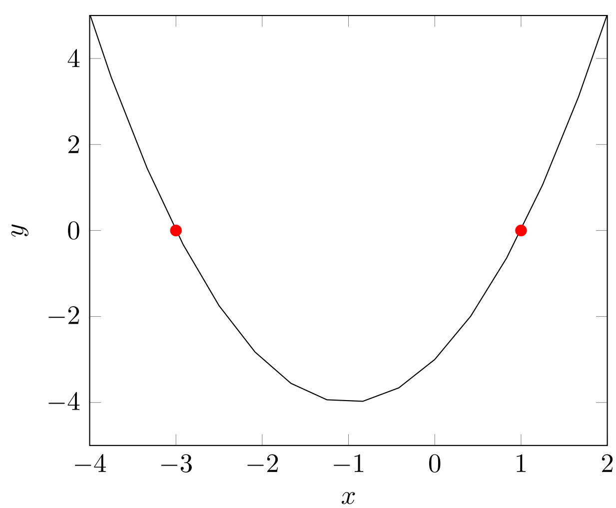
$$2\left(\sqrt{13} - \sqrt{4}\right) \approx \boxed{3.211}$$

2.1) ***A)*** *Find the roots of the quadratic equation* $y = x^2 + 2x - 3$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-2 \pm \sqrt{2^2 - 4(-1)(-3)}}{2(1)} = \frac{-2 \pm \sqrt{16}}{2}$$

$$\boxed{x = 1 \quad \& \quad\quad -3}$$

B) *Graph the same function to verify those points.*



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2.2 *A particle's location is* $(1, 4, 7)$ *at* $t - 0$*, and it's velocity is given by* $\vec{v}(t) = (4t+3)\hat{i} + (2t)\hat{j} + (6t+1)\hat{k}$*.Find the particle's location as a function of time, and evaluate for* $t = 6$

A)

$$\vec{x}(t) = (2t^2 + 3t + x_i)\hat{i} + (t^2 + c_j)\hat{j} + (3t^2 + t + x_k)\hat{k}$$

$$c_i = 1 \quad c_j = 4 \quad c_k = 7$$

$$\boxed{\vec{x}(t) = (2t^2 + 3t + 1)\hat{i} + (t^2 + 4)\hat{j} + (3t^2 + t + 7)\hat{k}}$$

B)

$$\vec{x}(6) = 91\hat{i} + 40\hat{j} + 121\hat{k}$$