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

$$34 + 126 = 160$$

B *Find the same sum using long addition.*

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

1.2 *Evaluate the following definite integral:*

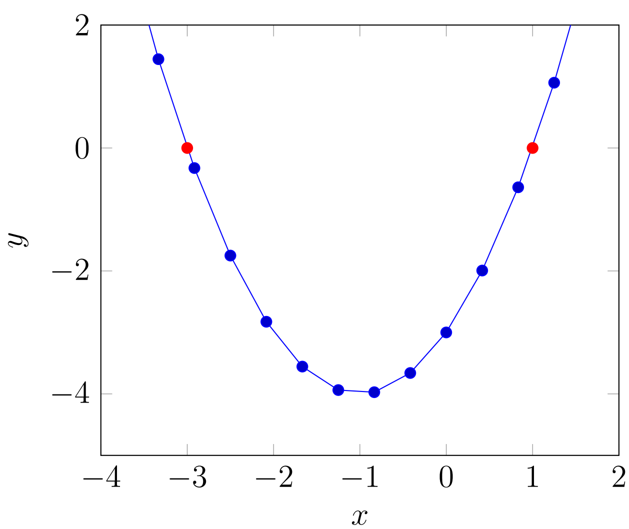
$$\int_0^3 \sqrt{x^2+4}dx$$

$$u = x^2 + 4 \quad du = 2x$$
$$\Rightarrow \quad \int_{0^2+4}^{3^2+4} \sqrt{u}du = \frac{1}{2}u^{-\frac{1}{2}}\Big|_4^{13}$$
$$\frac{1}{2\sqrt{13}} - \frac{1}{2\sqrt{4}} \approx -0.113$$

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

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \tag{1}$$
$$a = 1, b = 2, c = -3 \tag{2}$$
$$x = \frac{-2 \pm \sqrt{16}}{2} \tag{3}$$
$$x = 1, -3 \tag{4}$$

B *Graph the same equation to verify those points.*



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

Let $\vec{p}=(1,4,7)$ at $t=0$

$$\frac{d\vec{r}}{dt}=\vec{v}(t)$$

$$d\vec{r}=\vec{v}(t)dt$$

$$\int d\vec{r}=\int \vec{v}(t)dt$$

$$\vec{r}(t)=\int (4t+3)\hat{\imath}+(2t)\hat{\jmath}+(6t+1)\hat{k}dt$$

$$\vec{r}(t)=(2t^2+3t)\hat{\imath}+(t^2)\hat{\jmath}+(3t^2+t)\hat{k}+\vec{C}\text{, where }\vec{C}\text{ is a constant vector.}$$

When $t=0$, $\vec{C}=\vec{p}=(1,4,7)$.

$$\Rightarrow \quad \vec{r}(t)=91\hat{\imath}+40\hat{\jmath}+121\hat{k}$$