(1) Simplify the following expressions:

(a)
$$\frac{d}{dx} \int_1^{\sqrt{x}} \sin(t^2)\,dt$$

(b)
$$\frac{d}{dx} \int_x^0 \frac{ds}{\sqrt{s^2+1}}$$

(c)
$$\frac{d}{dx} \int_{-x}^{x^2} e^{r^2-r}\,dr$$

(2) Evaluate the following integrals using the Fundamental Theorem of Calculus:

(a)
$$\int_1^4 \frac{1-\sqrt{t}}{t}\,dt$$

(b)
$$\int_0^1 (1-\sqrt{s})(s+2)\,ds$$

(c)
$$\int_0^1 \frac{1}{e^x}\,dx$$