

1. (14 points) (a) An antiderivative of

$$f(t) = \sin(t) + \frac{1}{\cos^2 t}$$

is $F(t) =$ _____.

(b) If $\int_0^3 f(x) dx = 3$, then $\int_0^3 (f(x) + 2) dx =$ _____.

(c) A cubic polynomial (3rd degree polynomial) always has a

(i) local maximum Yes No

(ii) local minimum Yes No

(iii) global maximum Yes No

(iv) global minimum Yes No

(v) inflection point Yes No

(d) The exact value of c such that

$$\int_0^c x\sqrt{x} dx = \frac{4}{5}$$

is $c =$ _____.