

Name: _____ ID #: _____

NO CALCULATORS

1. [20 points] Review problems.

a. Find dy/dx at $(2, 1)$ where $y^3 + xy + x^2 = 7$.

b. The graph of $2x^2 + 4y^2 = 9$ is an ellipse. Find the xy-coordinates of each point where the line tangent to this ellipse has slope 1.

2. [80 points] Do the following integrals.

a. $\int x \sin(x) \, dx$

b. $\int \cos^4(2x) \, dx$

c. $\int \frac{2x - 1}{(x + 2)(x + 1)} \, dx$

d. $\int x e^{2x} dx$

e. $\int \arccos(x) dx$

f. $\int \sin(2x) \sin(3x) dx$

g. $\int \sec^3(x) \, dx$

h. $\int \frac{1}{x^2 + 1} \, dx$