

**Instructions:** This quiz is closed book, closed note, and an individual effort. Electronic devices other than approved calculators are not allowed on your person (e.g., no cell phones or calculators with CAS). Answer each question. **Show all work to receive full credit.** Unless the question specifies, you may provide either an exact answer or round to two decimal places. If you get stuck, please attempt to explain what you want to do. This may give more partial credit.

1. (2 points each) Evaluate the following integrals (Note that some are indefinite and others are definite).

(a)  $\int_1^4 \frac{\ln(x)}{x} dx$

(b)  $\int \frac{(\sqrt{x} + 1)^2}{\sqrt{x}} dx$

(c)  $\int_1^4 \frac{12x + 12}{3x^2 + 6x + 22} dx$

(d)  $\int (5x + 2)^4 dx$

(e)  $\int x(x - 1)^{10} dx$

2. (4 points) Let a consumer demand function be given by  $D(q) = 38 - 2q$  and a supply function be given by  $S(q) = 2 + 4q$ . Find both the consumer and producer surplus.

3. (4 points) Let a consumer have a demand function given by  $7q + 21p = 336$  and the supply function be given by  $3p - 5q = 12$ . Find both the consumer and producer surplus.