1. (a) HINT: Substitution: let $u = 1 - x$.
   ANSWER: $\frac{2}{3}$

(b) HINT: Substitution: let $u = 1 + \ln x$.
   ANSWER: $\frac{7}{3}$

(c) HINT: Substitute: let $u = \sin x$.
   ANSWER: $2\sqrt{\sin x} + C$

(d) HINT: Partial fractions: $\frac{x-2}{x(x-1)} = \frac{1}{x} + \frac{2}{x^2} - \frac{1}{x-1}$
   ANSWER: $\ln |x| - \frac{2}{x} - \ln |x-1| + C$

(e) HINT: First evaluate the integral from 0 to $b$ and then take the limit as $b$ approaches infinity.
   ANSWER: $\frac{1}{2}$

(f) HINT: First evaluate the integral from $b$ to 1 and then take the limit as $b$ approaches 0 (from the positive direction).
   ANSWER: $\frac{4}{3}$

(g) HINT: First evaluate the integral from $b$ to 1 and then take the limit as $b$ approaches 0 (from the positive direction).
   ANSWER: This improper integral diverges.

2. (a) HINT: $w(3.25) - w(0) = \int_0^{3.25} (8t + 1)^{2/3} \, dt$. Do substitution with $u = 8t + 1$.
   ANSWER: $\frac{3}{20}(2^{5/3} - 1) \approx 18.15$ grams

(b) HINT: Compute $w(10) - w(2) = \int_2^{10} (8t + 1)^{2/3} \, dt$, substitute 29 for $w(2)$, and solve for $w(10)$.
   ANSWER: 134.30 grams

3. HINT: The area is $\int_{-1}^4 (x + 28) - (x^4 - 8x^3 + 18x^2) \, dx$.
   ANSWER: 62.5

4. HINT: The average value is $\frac{1}{5} \int_0^{5\pi} x \sin \left(\frac{1}{5}x\right) \, dx$. Use integration by parts to do this integral.
   ANSWER: 5

5. ANSWER: Only I is true since the derivative of $xe^{-x}$ is equal to $e^{-x}(1 - x)$. Statement II is not true since the derivative of $e^{-x}(1 - x)$ is not equal to $xe^{-x}$.

6. ANSWER: $\int_{-1}^1 e^{-x^2} \, dx \approx 0.8220$