Math 122 (Section 11) **Quiz 9 (take-home)** **due November 27, 2007**

Name _____

1. Without using a calculator, evaluate the following indefinite integral.

$$\int \left(8e^{2x} - \frac{1}{5x} + 3\right)\, dx$$

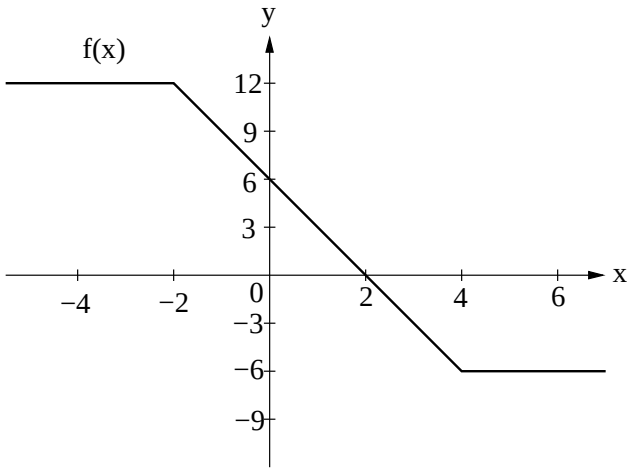
2. Without using a calculator, evaluate the following definite integral. Simplify your answer as much as possible.

$$\int_1^2 \left(30x^2 - 6x\right)\, dx$$

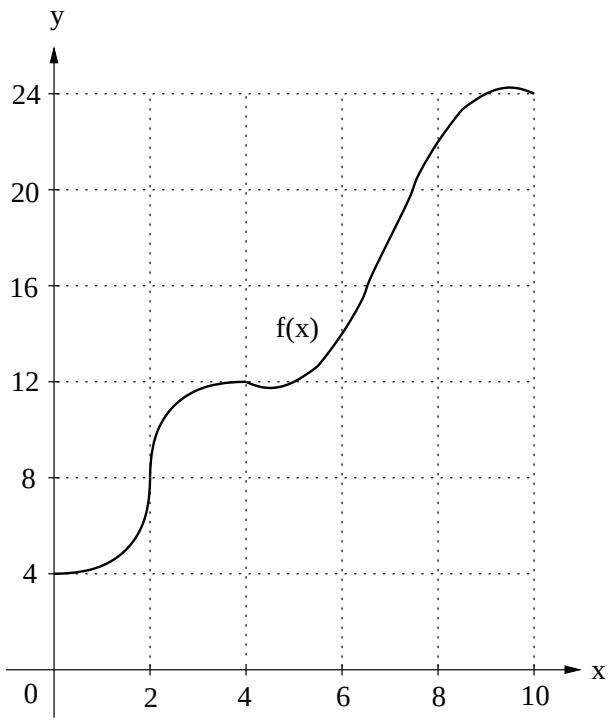
3. Tom measured the tree in his yard and found that it was 53 inches tall. He then applied a strange new fertilizer which caused the tree to grow at a rate of $35te^{-t}$ inches per hour where t is the number of hours since the application of the fertilizer. How tall was the tree 4 hours after he applied the fertilizer? Your answer should be given in inches and should be accurate to at least 2 places after the decimal point.

4. If a population is growing by $5e^{0.03t}$ people per year where t represents the number of years since 1960, then what is the change in population between years 1980 and 1990 ?

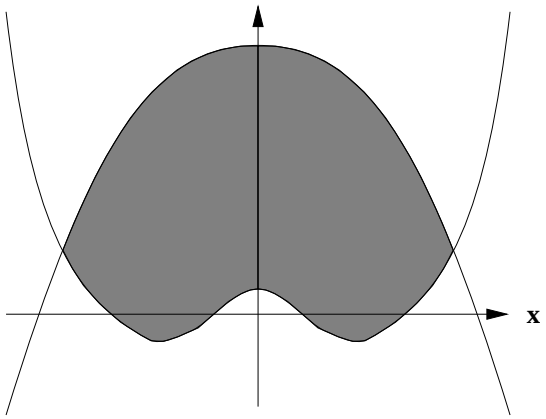
5. Find the exact value of $\int_{-4}^{6} f(x)\, dx$.



6. Approximate $\int_0^{10} f(x)\,dx$. Be sure your answer is within 4 of the exact value.



7. The graphs of $f(x) = x^4 - 7x^2 + 5$ and $g(x) = 86 - 7x^2$ are sketched below and the area between the two curves is shaded in. Find the **exact area** of this shaded region. Your final answer should be correct to one place after the decimal point and you must show sufficient work to justify your answer.



8. Sketch a graph of $y = x^3 - x^2 - 2x$ on the interval $[-1, 2]$. Shade in the region between the graph and the x-axis and find the exact area of this shaded region.