Worksheet 4
Some Extra Problems
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Quick review of linear interpolation:

Approximate $\sqrt[3]{22}$.

We know $\sqrt[3]{27} = 3$ and $\sqrt[3]{8} = 2$ So we set up the chart

8	2
22	x
27	3

8 to 22 is 14
8 to 27 is 19
2 to x is n
2 to 3 is 1
So, $\frac{14}{19} = \frac{n}{1} \implies n = \frac{14}{19} \implies x \approx 2 + \frac{14}{19}$ which is $\frac{52}{19}$.

1. Find
$$\int_1^3 (x^3 - 6x)^2 dx$$
2. Find
$$\int_1^3 x \cdot (x^3 - 6x)^2 dx$$
3. Find
$$\int_1^3 (x - 2) \cdot (x^3 - 6x)^2 dx$$
4. Find
$$\int_1^3 (x^2 - 2) \cdot (x^3 - 6x)^2 dx$$
5. Find
$$\int (12x^2 - 24) \cdot (x^3 - 6x)^7 dx$$
6. Consider the real number $\sqrt{77}$. Approximate it using differentials.
7. Consider the real number $\sqrt{77}$. Approximate it using linear interpolation.
8. Consider the real number $\sqrt[5]{220}$. Approximate it using differentials.
9. Consider the real number $\sqrt[5]{220}$. Approximate it using linear interpolation.