MATH 141, Fall 2025, QUIZ 11 answers

1. Evaluate the following indefinite integrals:

   a. $\displaystyle\int \frac{7}{1+x^2}\,\mathrm{d}x = 7\arctan x + C$

   b. $\displaystyle\int (x^3 + 5e^{5x})\,\mathrm{d}x = \frac{1}{4}x^4 + e^{5x} + C$

   c. $\displaystyle\int \sin x\,\mathrm{d}x = -\cos x + C$

You need to know that an indefinite integral means "Write down all functions whose derivative is _____." The "+C" is necessary because of the word "all" here. You will lose points if you leave out "+C".

For example, in part a, you know that $\dfrac{\mathrm{d}}{\mathrm{d}x}(7\arctan x) = \frac{7}{1+x^2}$. *Parts b and c are the same idea.*

2. $\displaystyle\int_0^4 f(x)\,\mathrm{d}x \approx 2\cdot 1 + 1\cdot 1 + 2\cdot 1 + 4\cdot 1 = 9$