

MATH 1300 - Calculus 1, Fall 2016

Course Info

Syllabus

Sections/Instructors

Schedule

WebAssign

Homework

Projects

Activities

Exams

More resources

Written homework is due once a week, on Thursdays, at the start of your recitation section. In these problems you should show all of your work in complete mathematical "sentences", writing complete English sentences when you explain your logic. You should expect some homework problems to be more challenging than what you might see in WebAssign or on exams. Here are [guidelines for how to write your homework](#). Please always staple your homework and label it with your section number. Late homework will not be accepted.

- HW 1 (due Thursday, August 25):
Section 1.1: 12, 60, 52, 66, 74
Section 1.2: 18
Section 1.3: 4, 54, 60, 62
[Optional challenge problem](#)
- HW 2 (due Thursday, September 1)
Do these two graphical problems: [Graphical problems from 2.1](#)
Section 2.1: 4
Section 2.2: 8, 12, 14
Optional challenge problem: Complete 5g from Project 1.
- HW 3 (due Thursday, September 8)
Section 2.3: 8, 22, 31, 49
Section 2.4: 8, 9, 16, 42
[And here are some optional challenge problems](#)
- HW 4 (due Thursday, September 15)
Do these two required problems: [Interpretation of the derivative](#)
Section 2.5: 6, 26, 32, 48, 55
Section 2.6: 12, 17, 21, 30 (for problem 30, use the limit definition of derivative to find $f'(a)$)
Section 2.7: 10, 34
[Optional challenge problems](#)
- HW 5 (due Thursday, September 22)
Do these two graphical problems: [Graphical problems for HW5](#)
Section 2.8: 9, 22, 25
Section 3.1: 48, 62, 66
Optional challenge problem: Find a possible formula for each function in the derivative matching card activity from last week (see the "Activities" page of this website).
- HW 6 (due Thursday, September 29)
Do this problem: [Additional problem for HW6](#)
Section 3.2: 48d, 50, 51, 52, 58
Section 3.3: 16, 37, 39, 40
Optional challenge problem: Section 3.2: 53
- HW 7 (due Thursday, October 6)
Do these problems: [additional problems for HW 7](#)
Section 3.4: 56, 74
Section 3.5: 35, 44
Section 3.6: 32, 41, 42 (try problem 22 after you learn section 3.7)
Optional challenge problem: Sketch the circles $\sqrt{x^2+y^2}=1$ and $\sqrt{(x-3)^2+y^2}=4$. There is a line with positive slope that is tangent to both circles. Determine the points at which this tangent line touches the circle.
- HW 8 (due Thursday, October 13)
Section 3.7: 29, 32, 34, 45
Section 3.8: 6, 10, 24, 30
Section 3.9: 4, 10, 20, 30
- HW 9 (due Thursday, October 20)
Section 4.1: 10, 14, 26, 44
- HW 10 (due Thursday, October 27)
Section 4.2: 14, 62, 66
Section 4.3: 1, 20, 34, 66, 70
And this required additional problem: Find the absolute extrema of the function $f(x) = xe^{-x^2/18}$ on the interval $[-2, 4]$.
- HW 11 (due Thursday, November 3)
Section 4.5: 42, 54, 64, 66, 73
Optional (do this if you know you need to improve your algebra skills): Graph the function $f(x) = (x-2)^{1/3}x^{2/3}$. Include calculation of the first and second derivatives and full analysis of the

increasing/decreasing behavior, local extrema, concavity and inflection points, and end behavior.

- HW 12 (due Thursday, November 10)
Section 4.4: 12 and 14 (Include graphs of f and f' to fully explain the behavior of f . Use technology to calculate these derivatives.)
Section 4.6: 14, 34, 48, 22 (but use $V=2000$ cubic centimeters)
Section 4.8: 16, 46
And this required problem: Batman was driving the Batmobile at 90 mph ($=132$ ft/sec), when he sees a brick wall directly ahead.
When the Batmobile is 400 feet from the wall, he slams on the brakes, decelerating at a constant rate of $\sqrt{22}$ ft/sec².
Does he stop before he hits the brick wall? If so, how many feet to spare? If not, what is his impact speed?
Now the Joker had been driving next to him, also at 90 mph. But the Joker did not hit his brakes as soon as Batman, continuing for 1 second longer than Batman before hitting his brakes, decelerating at a constant rate of $\sqrt{22}$ ft/sec².
How fast is he going when he hits the wall? (Don't worry about Joker - he jettisoned at the last instant, to fight for another day!)
- HW 13 (due Thursday, November 17)
5.1: 12, 18, 22
5.2: 42, 48, 49
- HW 14 (due Thursday, December 1)
5.3: 50, 56, 58, 63, 68, and this problem:
Suppose h is a function such that $h(2)=-4$, $h'(2)=-7$, $h''(2)=6$, $h(5)=8$, $h'(5)=10$, and $h''(5)=20$, and h is continuous everywhere. Evaluate $\int_2^5 5h''(u) du$.
- HW 15 (due Thursday, December 8)
5.4: 6, 18, 23, 30
5.5: 15, 68, 70
6.1: 2, 4, 10
Challenge: Evaluate exactly $\int_0^{\sqrt[4]{3}} \frac{x}{1+x^4} dx$
Challenge: Evaluate exactly $\int_0^{\pi/4} \sec^6 x \tan x dx$