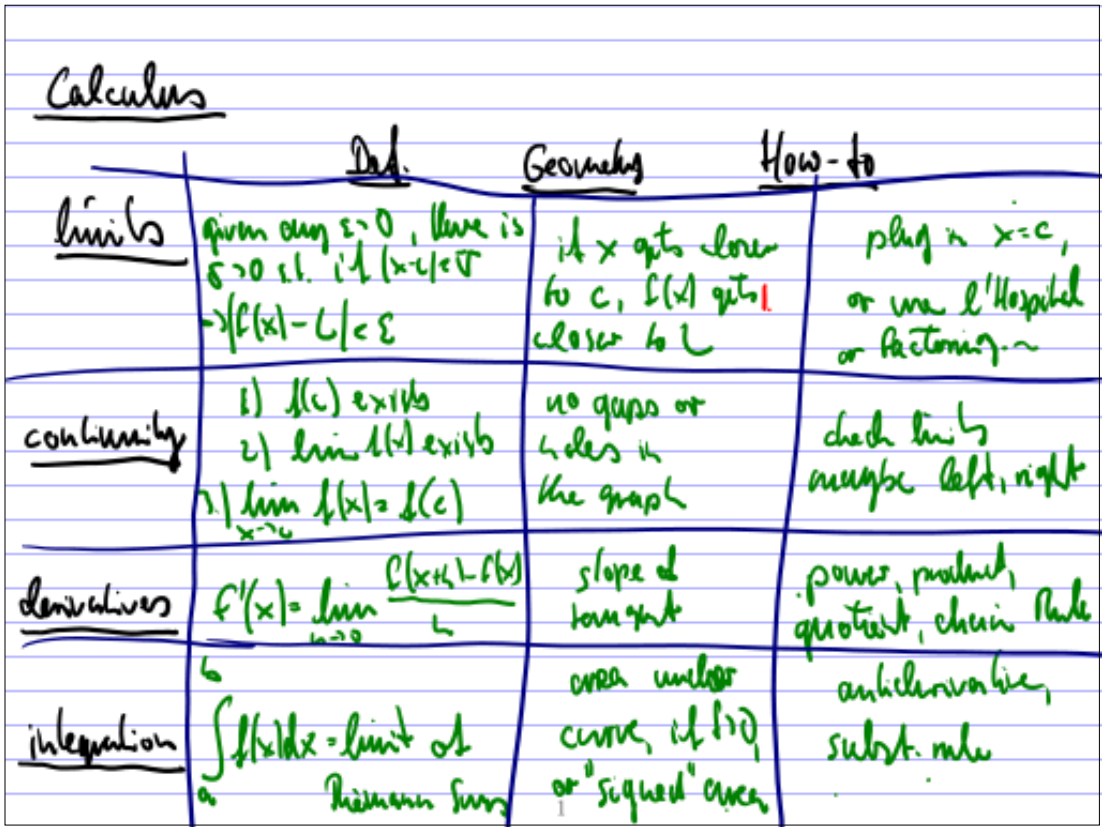
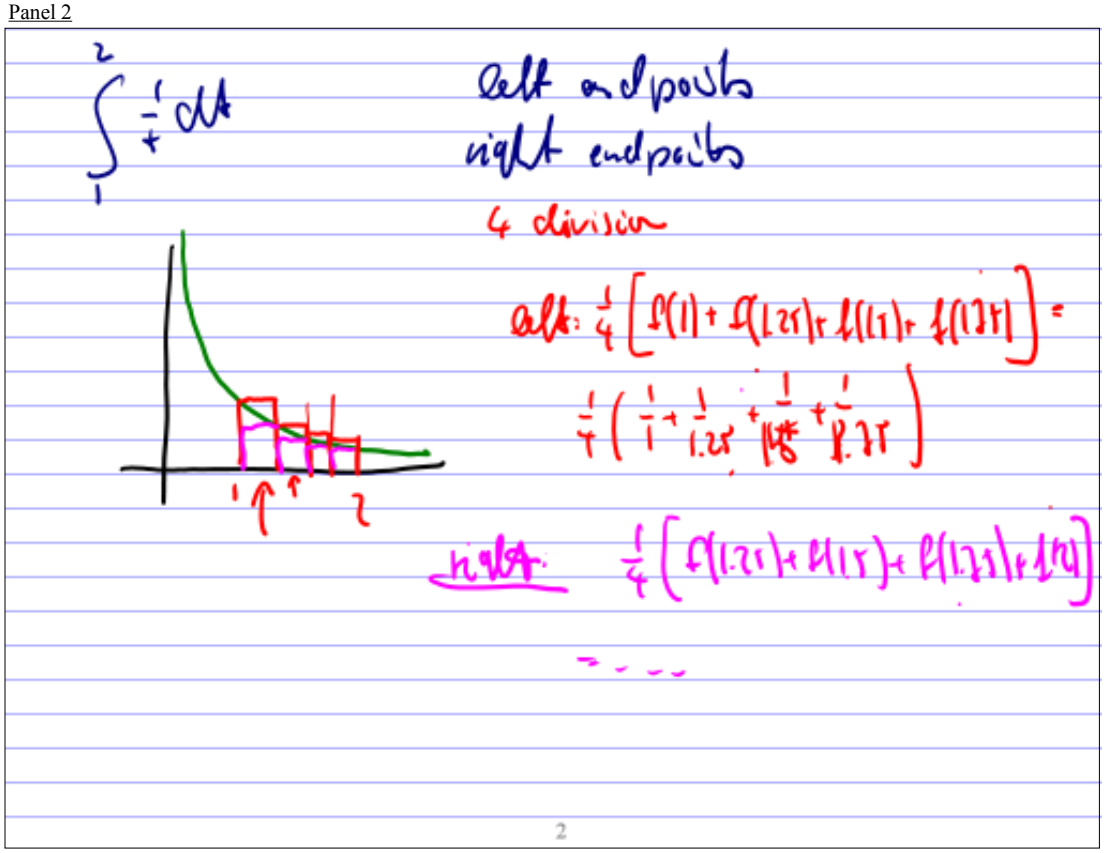
Panel 1



Panel 2



Panel 3

$f(x) = \arctan(x^2)\left(1+x^4\right)^3$

$\frac{1}{1+(x^2)^2}\cdot 2x\left(1+x^4\right)^3 + \arctan(x^2)\cdot 3\left(1+x^4\right)^2\cdot 4x^3$

$\int_0^{\pi/4} \frac{\sin(x)}{\cos^3(x)}\,dx = -\int_1^{1/\sqrt{2}} \frac{1}{u^3}\,du = -\frac{1}{-2}u^{-2}\Big|_1^{1/\sqrt{2}} = +\frac{1}{2}\left(2-1\right) = \frac{1}{2}$

$u = \cos(x)$

$du = -\sin(x)\,dx$

If $x=0$, then $u=\cos(0)=1$

If $x=\frac{\pi}{4}$, $\cos\left(\frac{\pi}{4}\right)=\frac{1}{\sqrt{2}}$

3

Panel 4

$\int x^2 e^{-x^3}\,dx = -\frac{1}{3}\int e^u\,du = -\frac{1}{3}e^u + C = -\frac{1}{3}e^{-x^3} + C$

$u = x^2$ $\quad u = -x^3$

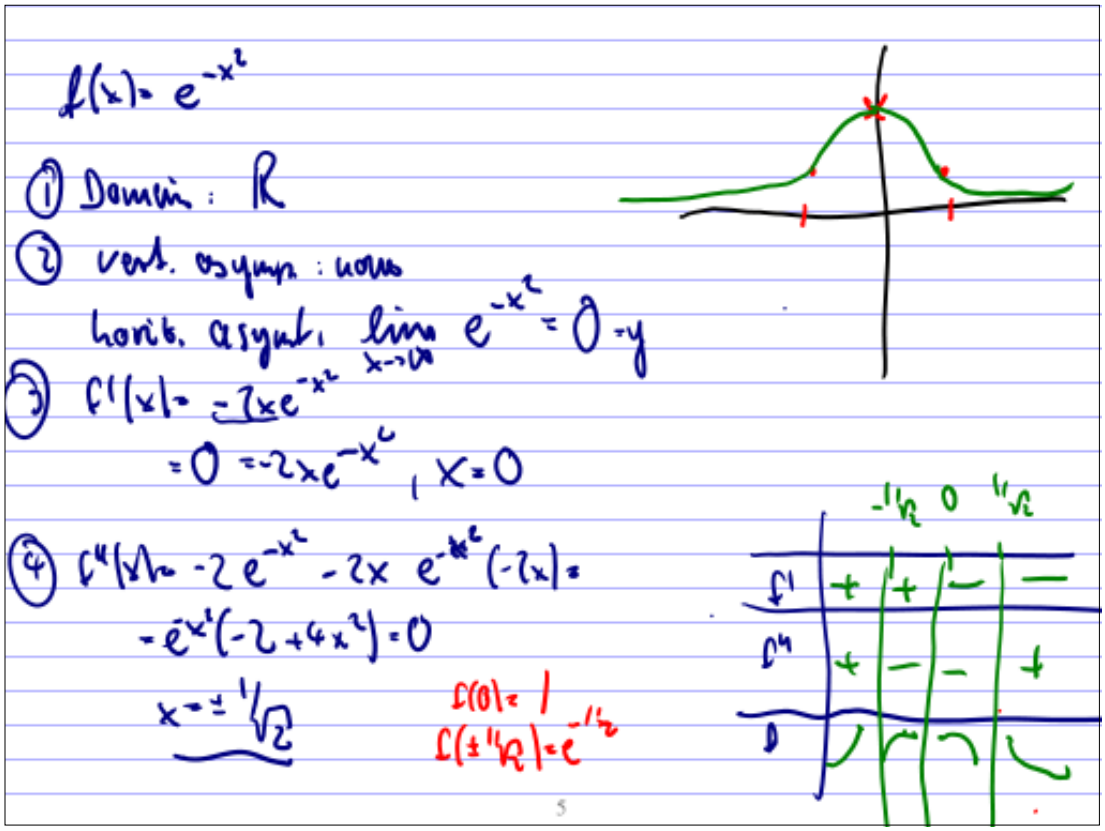
$du = 2x\,dx$ $\quad du = -3x^2\,dx$

Exam:

1. Definitions
2. Use definitions
3. Picture problem
4. limits
5. derivs
6. Integrals
7. Sketch a graph rational or using ln, exp
8. (9) surprise (2nd fund. thm calc)
10. Story prob. (exp. growth/decay or max/min)

4

Panel 5


f(x) = e^{-x^2}
① Domain: R
② vert. asymp: none
horiz. asymp: lim_{x→∞} e^{-x^2} = 0 = y
③ f'(x) = -2xe^{-x^2}
= 0 = -2xe^{-x^2}, x = 0
④ f''(x) = -2e^{-x^2} - 2x e^{-x^2}(-2x) =
-e^{-x^2}(-2 + 4x^2) = 0
x = ±1/√2
f(0) = 1
f(±1/√2) = e^{-1/2}
-1/√2 0 1/√2
f'
f''
D
5