Math 181 Friday, January 22 Section 5.3

WW 5.3 Due Date moved (Tue AM)

MON - 5.4 / 5.5

TUE - 5.6 (in-person)

Add-on to yesterday:

$$R_n = \frac{2(10n^2+13n+4)}{n^2}$$

$$\lim_{n\to\infty} R_n = \lim_{n\to\infty} \frac{20n^2}{n^2} + \frac{26n}{n^2} + \frac{8}{n^2}$$

$$= \lim_{n\to\infty} 20 + \frac{26}{n} + \frac{8}{n^2}$$

$$= \lim_{n\to\infty} 20 + 0 + 0$$

$$= 20$$

$$\int_1^3 x^3\,dx = \left.\frac{x^4}{4}\right|_1^3$$

antiderivative

$$= \frac{3^4}{4} - \frac{1^4}{1} = \frac{81}{4} - \frac{1}{4}$$

$$= \frac{80}{4} = 20$$

Derivatives

\$10	$2x$	x^2
\$20	x^5	$\frac{1}{6}x^6$
\$30	$\cos(x)$	$\sin(x)$
\$40	$\frac{1}{1+x^2}$	$\arctan(x)$
\$50	$3x^2(1+x^3)^7$	$\frac{1}{8}(1+x^3)^8$

Know your derivative formulas "backwards and forwards"

$\int f(x)\,dx$ not a definite integral, not area under a curve, not $\int_a^b f(x)\,dx$

$\int f(x)\,dx$ indefinite integral, antiderivative

$\int f(x)\,dx = F(x)$ if $\frac{d}{dx}F(x) = f(x)$.

Ex ($20)

$$\int x^5\,dx = \frac{x^6}{6} + C$$

Ex

$$\int (3x+5)^4\,dx = \frac{1}{15}(3x+5)^5 + C$$

Ex $\int \sec^2(8t)\,dt = \frac{1}{8}\tan(8t) + C$

Ex $\frac{dy}{dx} = 3x^2$ $\quad y(3) = 20$ $\quad y = ?$

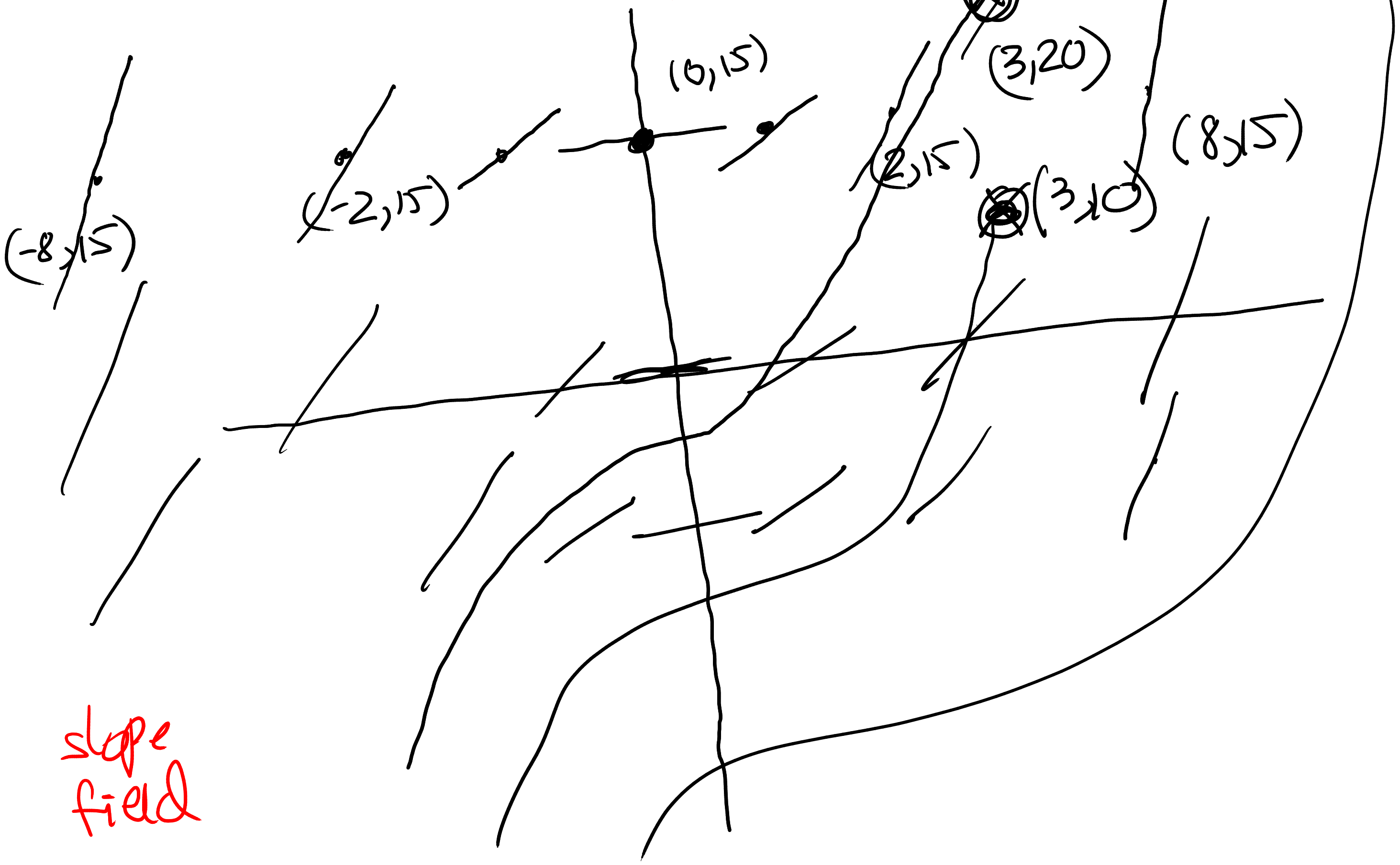
initial condition

$y = x^3 + C$

$20 = y = 3^3 + C$

$= 27 + C \Rightarrow C = -7$

$y = x^3 - 7$



slope field