Review Part II

(1) Find the limit if it exists.

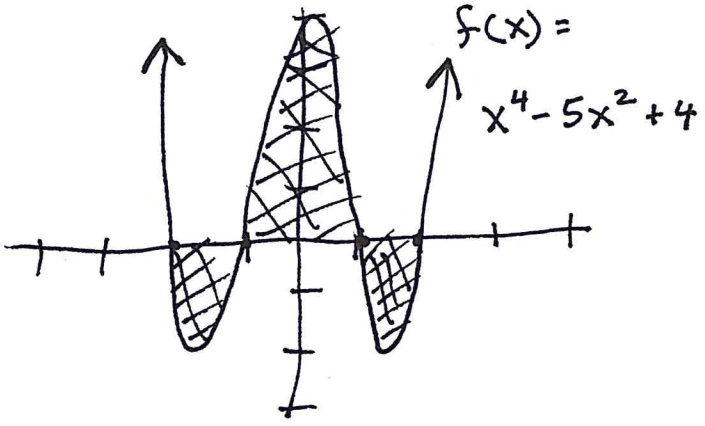
a) $\lim_{x \to 4} \dfrac{\sqrt{5-x} - 1}{4 - x}$

b) $\lim_{x \to \frac{\pi}{2}^-} \sec x$

(2) A 4.5 ft girl runs 4 ft/sec from a lamppost that is 13 ft tall. At what rate is the shadow changing when she is 17 ft from the lamppost?

③ Find the local extrema and inflection point for $f(x) = \dfrac{2x}{x^2+1}$

④ Find the area



(5) Find $\int_{-\frac{\pi}{2}}^{\pi} 2\sin^7 x \cos x \, dx$

(6) Find area enclosed by $y = 8 - x^2$, $y = x^2$

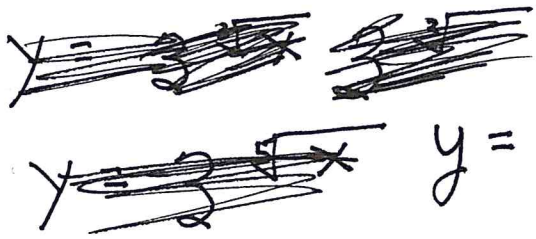
(7) Find $\int \frac{x^2}{x^3+1} \, dx$

(8) Find $\frac{dy}{dx}$ if $y = \log_{14} \frac{x^3\sqrt[4]{x-2}}{(x+1)^7\sqrt{x-1}}$

(9) Find y' if

$$y = \frac{x^2 \sqrt[4]{x^3 + x}}{(3x+1)^{3/4}}$$

(10) Find y' if



$y = 7\sqrt[3]{x}$

(11) $$\int \frac{dx}{\sqrt{-x^2-10x-16}}$$

(12) A vertical right cylindrical tank 18 ft tall and 12 ft diameter is ~~half~~ full of oil weighing 58 lb/ft^3. How much work does it take to empty half the tank?

(13) Find

$$\int_{\ln 2}^{\ln 7} \cosh x \, dx$$