(b) Find the limit: $\lim_{x\to -1}\dfrac{\sqrt{x^2+8}-3}{x+1}$

Q.2 **(a)** At what points are the function y= $\dfrac{x+1}{x^2-4x+3}$ is continuous?

(b) Find $\dfrac{dy}{dx}$ if $y = \sin^{-1}(3x-4)$

Q.3 **(a)**Using product rule, find $\dfrac{dy}{dx}$ of the function: $y=(\sin x+\cos x)\sec x$

(b) Using quotient rule, find $\dfrac{dy}{dx}$ of the function: $y=\dfrac{2x+5}{3x-2}$

Q.4 **(a)**Find the area of the region between the x-axis and the graph of
f(x) = $x^3-3x^2+2x, where \quad 0\le x\le 2$

(b) Find the Taylor's series for the function $f(x)=\dfrac{1}{1-x}$ *at* $x=2.$

Q.5 **(a)**Evaluate the integral $\int\dfrac{3x-17}{(x-3)(x+1)}dx$ using partial fraction

(b) Evaluate the following integral by using the given substitution
$\int 12\left(y^4+4y^2+1\right)^2\left(y^3+2y\right)dy,$ *substitute* $u=y^4+4y^2+1.$

Q.6 **(a)**Write the following function in the form of $y=f(u)$and $u=g(x)$**,** then find $\dfrac{dy}{dx}$ as a function of x **(**Chain rule). $y=\tan(10x-5)$

(b) Find the domain and range of the function $y=\sqrt{4-x}$.

Q.7 **(a)**Evaluate the integral (i) $\int_{-2}^{0}(2t+5)dt$ $(ii)\int_{0}^{4}\left(3x-\dfrac{x^3}{4}\right)dx$

(b) Evaluate the integral $\int x^2\sin x\,dx$ using by parts formula

Q.8 **(a)** Find the absolute maximum and minimum values of $f(x)=x^2 on[-2,1]$

(b) Using derivative as a slope find line that are tangent and normal to the curve $f(x)=x^3-3x^2+x-1,$ at the given point$(3,2)$.