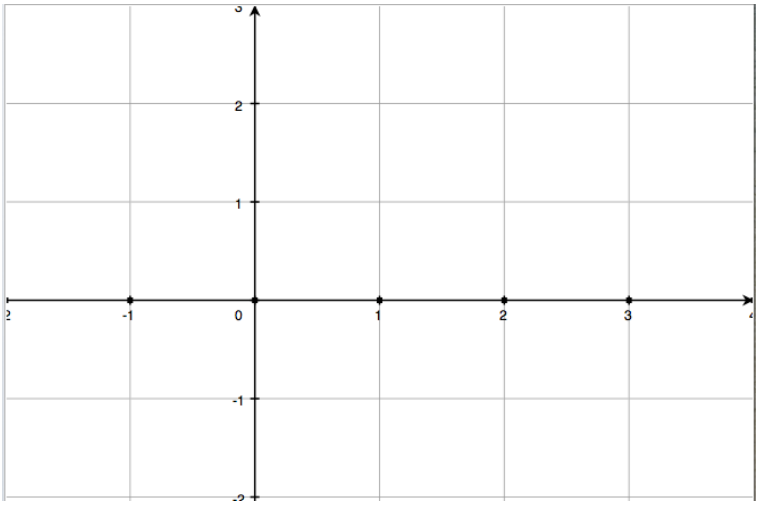
King **F**ahd **U**niversity for **P**etroleum and **M**inerals
Department of Mathematics & Statistics
Term 131 Math 101 (09) Quiz#3 (2.6 & 3.1)
Family Name: S.r#

Q1. Sketch a function that satisfies the following ;



i. $\lim_{x \to -\infty} f(x) = \infty$

ii. $f(0) = f(-1) = 1$

iii. $f'(1) = 0$

iv. $\lim_{x \to 0} f(x) = 0$

v. $f(x)$ has a horizontal asymptote, $y = -1$

Q2. Find the equation of the vertical asymptote(s) of $f(x) = \dfrac{x^2 - 3x}{\left(\sqrt{x} - 1\right)x}$

Q3. Evaluate

i. $\lim_{x \to \infty} \left(x^2 - x + 1\right)$

ii. $\lim_{x \to -1^+} \dfrac{x}{\sqrt{1+x}}$

iii. $\lim_{x \to 0^+} \dfrac{x - x^2}{x + 2x^2 - x^3}$

iv. $\lim_{x \to \infty} \left(\sqrt{x^2 + 3x} - x\right)$

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Term 131 Math 101 (16) Quiz#3 (2.6 & 3.1)
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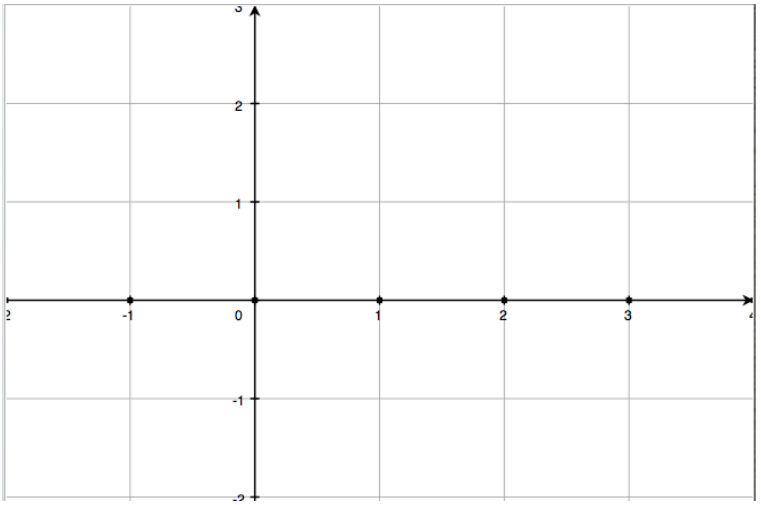
Q1. Sketch a function that satisfies the following ;



i. $\lim_{x\to\infty} f(x) = 0$

ii. $f(0) = f(1) = -1$

iii. $\lim_{x\to 0} f(x) = 1$

iv. $f(x)$ has a vertical asymptote, $x = 1$

v. $f(x)$ has a horizontal asymptote, $y = 2$

Q2. Find the equation of the horizontal asymptote(s) of $f(x) = \dfrac{\sqrt{x^2+1}}{\sqrt[3]{x^3-1}}$

Q3. Evaluate

i. $\lim_{x\to-\infty} \left(x^3 - x - 3\right)$

ii. $\lim_{x\to-\infty} \left(e^x + x\right)$

iii. $\lim_{x\to\infty} \dfrac{x^{-2} - x^{-1} + 1}{x^{-3} + x^{-1} - 1}$

iv. $\lim_{x\to -1^-} \left(\dfrac{x^4 + 2x}{x^2 - 1}\right)$