What day of the month is your birthday ?  __ __
What are the last 2 digits of your address ?  __ __
What are the last 2 digits of your zip code ?  __ __
What are the last 2 digits of your social security number ?  __ __
[IF YOU DO NOT HAVE A SOCIAL SECURITY NUMBER, USE YOUR STUDENT ID NUMBER]

Graph the function $f(x) = \dfrac{x+1}{x^2}$ using the full procedure discussed in class.     SCORE: ___ / 20 POINTS

[1] DOMAIN $\{x \neq 0\}$

DISCONTINUITY AT $x = 0$

[2] X-INT : $\dfrac{x+1}{x^2} = 0 \Rightarrow x = -1$  ½

y-INT : DNE ($x = 0 \notin$ DOMAIN)  ½

[3] $\lim\limits_{x \to 0^-} \dfrac{x+1}{x^2} = \infty \quad \left(\dfrac{1}{0^+}\right)$  }  VA  ½

$\lim\limits_{x \to 0^+} \dfrac{x+1}{x^2} = \infty \quad \left(\dfrac{1}{0^+}\right)$  }  ↙ STATED OR DRAWN

[4] $\lim\limits_{x \to \infty} \dfrac{x+1}{x^2} = \lim\limits_{x \to \infty} \dfrac{1}{2x} = 0$  }  HA  ½

$\lim\limits_{x \to -\infty} \dfrac{x+1}{x^2} = \lim\limits_{x \to \infty} \dfrac{1}{2x} = 0$  }  ↖ STATED OR DRAWN
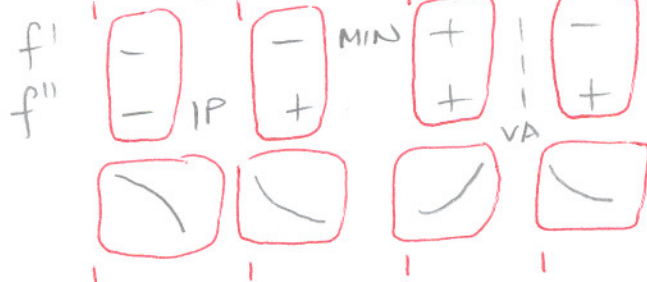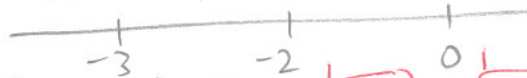
[5] $f(x) = x^{-1} + x^{-2}$

$f'(x) = -x^{-2} - 2x^{-3} = -x^{-3}(x+2)$  ½  DNE IF $x = 0 \notin$ DOMAIN

$= 0$ IF $x = -2$  POINT $\left(-2, -\dfrac{1}{4}\right)$

$f''(x) = 2x^{-3} + 6x^{-4} = 2x^{-4}(x+3)$  ½  DNE IF $x = 0 \notin$ DOMAIN

$= 0$ IF $x = -3$  POINT $\left(-3, -\dfrac{2}{9}\right)$

[6] N/A

[7]

| | | | | |
|---|---|---|---|---|
| $-x^{-3}$ | + | + | + | − |
| $x+2$ | − | − | + | + |
| $2x^{-4}$ | + | + | + | + |
| $x+3$ | − | + | + | + |

$-3 \qquad -2 \qquad 0$

[8]  f'   | − | − MIN + | − |
[9]  f''  | − IP + | + | + |  VA
[10]