

SCORE: ____ / 10 POINTS

NO CALCULATORS ALLOWED

Evaluate the following limits algebraically. Show all algebraic work.

SCORE: ____ / 8 POINTS

[a] $\lim_{x \rightarrow -1} \frac{x^3 - x}{x^2 - x - 2}$

$$= \lim_{x \rightarrow -1} \frac{x(x^2 - 1)}{(x-2)(x+1)}$$

$$= \lim_{x \rightarrow -1} \frac{x(x+1)(x-1)}{(x-2)(x+1)}$$

$$= \lim_{x \rightarrow -1} \frac{x(x-1)}{x-2}$$

$$= \frac{-1(-1-1)}{-1-2} = -\frac{2}{3}$$

[c] $\lim_{x \rightarrow -2} \frac{\frac{1}{x^2} - \frac{1}{4}}{x+2}$

$$= \lim_{x \rightarrow -2} \frac{\frac{\frac{1}{x^2} - \frac{1}{4}}{x+2} \cdot \frac{4x^2}{4x^2}}$$

$$= \lim_{x \rightarrow -2} \frac{4 - x^2}{4x^2(x+2)}$$

$$= \lim_{x \rightarrow -2} \frac{(2-x)(2+x)}{4x^2(x+2)}$$

$$= \lim_{x \rightarrow -2} \frac{2-x}{4x^2} = \frac{2-(-2)}{4(-2)^2} = \frac{4}{16} = \frac{1}{4}$$

[b] $\lim_{x \rightarrow 3} \frac{9-3x}{\sqrt{2x-5}-1}$

$$= \lim_{x \rightarrow 3} \frac{9-3x}{\sqrt{2x-5}-1} \cdot \frac{\sqrt{2x-5}+1}{\sqrt{2x-5}+1}$$

$$= \lim_{x \rightarrow 3} \frac{(9-3x)(\sqrt{2x-5}+1)}{2x-5-1}$$

$$= \lim_{x \rightarrow 3} \frac{(9-3x)(\sqrt{2x-5}+1)}{2x-6}$$

$$= \lim_{x \rightarrow 3} \frac{-3(x-3)(\sqrt{2x-5}+1)}{2(x-3)}$$

$$= \lim_{x \rightarrow 3} -\frac{3}{2}(\sqrt{2x-5}+1)$$

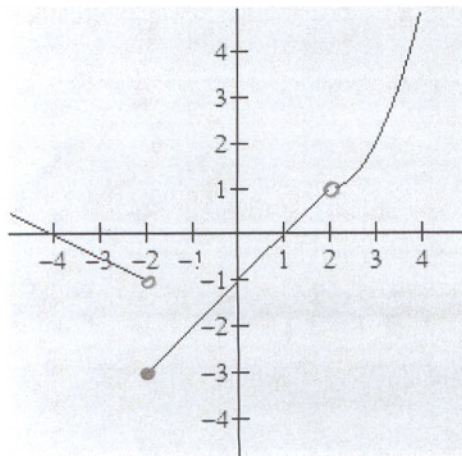
$$= -\frac{3}{2}(\sqrt{6-5}+1) = -3$$

1 POINT EACH

* SUBTRACT $\frac{1}{2}$ POINT FOR EACH QUESTION WHERE YOU DIDN'T WRITE " $\lim_{x \rightarrow}$ " APPROPRIATELY (MAXIMUM

Evaluate the following for the function graphed below. If a value does not exist, write DNE.

SCORE: ____ / 2 POINTS



[a] $\lim_{x \rightarrow -2^+} f(x) = -3$

[b] $f(-2) = -3$

[c] $\lim_{x \rightarrow 2} f(x) = 1$

[d] $\lim_{x \rightarrow -1} f(x) = -2$

$\frac{1}{2}$ POINT EACH

- $\frac{1}{2}$ POINTS