

Exercise 5

Evaluate the limit and justify each step by indicating the appropriate Limit Law(s).

$$\lim_{t \rightarrow -2} \frac{t^4 - 2}{2t^2 - 3t + 2}$$

Solution

$$\lim_{t \rightarrow -2} \frac{t^4 - 2}{2t^2 - 3t + 2}$$

The limit of a quotient is the quotient of the limits, provided the denominator is not zero.

$$\frac{\lim_{t \rightarrow -2} (t^4 - 2)}{\lim_{t \rightarrow -2} (2t^2 - 3t + 2)}$$

The limit of a sum (difference) is the sum (difference) of the limits.

$$\frac{\lim_{t \rightarrow -2} t^4 - \lim_{t \rightarrow -2} 2}{\lim_{t \rightarrow -2} 2t^2 - \lim_{t \rightarrow -2} 3t + \lim_{t \rightarrow -2} 2}$$

The limit of a constant times a function is the constant times the limit of the function.

$$\frac{\lim_{t \rightarrow -2} t^4 - \lim_{t \rightarrow -2} 2}{2 \lim_{t \rightarrow -2} t^2 - 3 \lim_{t \rightarrow -2} t + \lim_{t \rightarrow -2} 2}$$

Evaluate the limits.

$$\frac{(-2)^4 - 2}{2(-2)^2 - 3(-2) + 2}$$

$$\frac{7}{8}$$