Exercise 7

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

$$\lim_{x\to 8}\left(1+\sqrt[3]{x}\right)\left(2-6x^2+x^3\right)$$

Solution

$$\lim_{x\to 8}\left(1+\sqrt[3]{x}\right)\left(2-6x^2+x^3\right)$$

The limit of a product is the product of the limits.

$$\left[\lim_{x\to 8}\left(1+\sqrt[3]{x}\right)\right]\left[\lim_{x\to 8}\left(2-6x^2+x^3\right)\right]$$

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

$$\left(\lim_{x\to 8}1+\lim_{x\to 8}\sqrt[3]{x}\right)\left(\lim_{x\to 8}2-\lim_{x\to 8}6x^2+\lim_{x\to 8}x^3\right)$$

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

$$\left(\lim_{x\to 8}1+\lim_{x\to 8}\sqrt[3]{x}\right)\left(\lim_{x\to 8}2-6\lim_{x\to 8}x^2+\lim_{x\to 8}x^3\right)$$

Evaluate the limits.

$$\left(1+\sqrt[3]{8}\right)\left[2-6(8)^2+(8)^3\right]$$

$$(3)(130)$$

$$390$$