1.   Find the derivative of each function below and write your answers with no negative
        exponents.

(a) $f(x) = x^3 - 5x^2 + 11x - 6$ (b) $g(x) = \dfrac{6}{x^3}$

(c) $y = (x+4)(x-7)$ Hint: First expand the expression.

(d) $f(x) = 8e^x + \dfrac{x^2}{5}$

(e) $g(w) = \dfrac{w^4 - 5w^2 - 3}{w^2}$ (Hint: First write the expression as three separate fractions.)

(f) $y = (2x^2)^3$ (Hint: First simplify using properties of exponents.)

2.   If $f(x) = 4\sqrt{x} - \dfrac{2}{\sqrt{x}}$, find

(a) $f'(x)$ (b) $f'(4)$

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3. Write the equation of the tangent line to $f(x) = x^4 - 3x^3 + 7x - 8$ when x = 2 on the curve.

4. The equation of motion of a moving object is $s = 2t^2 + t^{3/2}$, where a is measured in feet and t is the time in seconds. Find each of the following and use appropriate units in your answers.

(a) The velocity after 4 seconds   (b) The acceleration after 4 seconds

5. The average price for a major league baseball game x years after 1990 can be modeled by $p(x) = 9.41 - 0.19x + 0.09x^2$.

(a) Use the model to find the instantaneous rate of change of the average ticket price in 2007.

(b) In a sentence, explain the meaning of your answer to part (a). Use appropriate units.

Answers

1 (a) $3x^2 - 10x + 11$ (b) $-\dfrac{18}{x^4}$ (c) $2x - 3$ (d) $8e^x + \dfrac{2}{5}x$ (e) $2w + \dfrac{6}{w^3}$ (f) $48x^5$

2 (a) $\dfrac{2}{\sqrt{x}} + \dfrac{1}{\sqrt{x^3}}$ (b) $\dfrac{9}{8}$ 3. $y = 3x - 8$ 4 (a) 19 ft/sec (b) $4.375\, ft/\sec^2$

5(a) \$2.87/year
(b) In 2007, the average ticket price of a major league baseball ticket was increasing at a rate of \$2.87 per year.