3.1 Hw Solutions

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Question 1:

Solution: 😊

$$\begin{aligned} g'(x) &= 9 \cdot 1 - 0 \\ &= 9. \end{aligned}$$

Question 2:

Solution: 😊

$$\begin{aligned} g'(t) &= 7(1) + 10t \\ &= 7 + 10t. \end{aligned}$$

Question 3:

Solution: 😊

$$\begin{aligned} \frac{5}{8}(2)x^{2-1} - 8(1) - 0 \\ = \frac{5}{4}x - 8. \end{aligned}$$

Question 4:

Solution: 😊

Since:

$$\frac{d}{dx}e^x = e^x.$$

$$f'(t) = -5e^t.$$

Question 5:

Solution: 😊

$$\begin{aligned} -4z^{-4-1} - \frac{1}{2}z^{\frac{1}{2}-1} \\ = -4z^{-5} - \frac{1}{2}z^{-\frac{1}{2}} \\ = -\frac{4}{z^5} - \frac{1}{2z^{\frac{1}{2}}}. \end{aligned}$$

Question 6:

Solution: 😊

$$\begin{aligned} & x^3(x+8) \\ &= x^4 + 8x^3 \\ &= 4x^3 + 24x^2. \end{aligned}$$

Question 7:

Solution: 😊

$$\begin{aligned} & 8e^x + 5x^{-\frac{1}{3}} \\ &= 8e^x + 5(-\frac{1}{3})x^{-\frac{1}{3}-1} \\ &= 8e^x - \frac{5}{3}x^{-\frac{4}{3}} \\ &= 8e^x - \frac{5}{3x^{\frac{4}{3}}}. \end{aligned}$$

Question 8:

Solution: 😊

$$\begin{aligned} & (8+q^{-1})(8+q^{-1}) \\ &= (8+\frac{1}{q})(8+\frac{1}{q}) \\ &= 8\cdot 8 + 2(\frac{8}{q}) + (\frac{1}{q})^2 \\ &= 64 + \frac{16}{q} + \frac{1}{q^2} \\ &= 64 + 16q^{-1} + q^{-2} \\ &= 0 - 16q^{-2} - 2q^{-3} \\ &= -\frac{16}{q^2} - \frac{2}{q^3}. \end{aligned}$$

Question 9:

Solution: 😊

e^{x+4} Gets left alone

So:

$$\begin{aligned} y' &= e^{x+4} + 0 \\ &= e^{x+4}. \end{aligned}$$

Question 10:

Solution: 😊

$f'(x)$:

$$f'(x) = 14x - 3x^2.$$

m_{tan}:

$$\begin{aligned} m_{tan} &= 14(1) - 3(1)^2 \\ &= 11. \end{aligned}$$

Equation:

$$\begin{aligned} y - 6 &= 11(x - 1) \\ y - 6 &= 11x - 11 \\ y &= 11x - 5. \end{aligned}$$

Question 11:

Solution: 😊

$G'(r)$:

$$\begin{aligned} G'(r) &= r^{\frac{1}{2}} + r^{\frac{1}{5}} \\ &= \frac{1}{2}r^{-\frac{1}{2}} + \frac{1}{5}r^{-\frac{4}{5}} \\ &= \frac{1}{2r^{\frac{1}{2}}} + \frac{1}{5r^{\frac{4}{5}}}. \end{aligned}$$

$g''(r)$:

$$\begin{aligned} G''(r) &= \frac{1}{2}r^{-\frac{1}{2}} + \frac{1}{5}r^{-\frac{4}{5}} \\ &= -\frac{1}{4}r^{-\frac{3}{2}} - \frac{4}{25}r^{-\frac{9}{5}} \\ &= -\frac{1}{4r^{\frac{3}{2}}} - \frac{4}{25r^{\frac{9}{5}}}. \end{aligned}$$

Question 12:

Solution: 😊

a.)

$$0.101 * 50 = 5.05.$$

So:

$$\frac{5.05}{P}.$$

$$3$$

b.)

$V'(P)$*:*

$$\begin{aligned} V'(P) &= 5.05p^{-1} \\ &= -5.05p^{-2} \\ &= -\frac{5.05}{p^2}. \end{aligned}$$

Plug in 50 for P:

$$\begin{aligned} &-\frac{5.05}{50^2} \\ &= -0.00202. \end{aligned}$$

Question 13:

Solution: 😄

y'*:*

$$\begin{aligned} y' &= 3x^2 + 6x - 9(1) - 0 \\ &= 3x^2 + 6x - 9. \end{aligned}$$

Question 14:

Solution: 😄

Question 15:

Solution: 😄