

## 3.1 Hw Solutions

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### Question 1:

*Solution:*

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

### Question 2:

*Solution:*

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

### Question 3:

*Solution:*

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

### Question 4:

*Solution:*

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Since:

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

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

### Question 5:

*Solution:*

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

### Question 6:

*Solution:*

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

### Question 7:

*Solution:*

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

### Question 8:

*Solution:*

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

### Question 9:

*Solution:*

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### Question 10:

*Solution:*

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**Question 11:**

*Solution:*



**Question 12:**

*Solution:*



**Question 13:**

*Solution:*



**Question 14:**

*Solution:*



**Question 15:**

*Solution:*

