

# حلول الفقرات المختارة من تمارين المحاضرة العاشرة:

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vii.  $y = \sqrt[5]{3x^2 + 4}$

الحل:

$$y = (3x^2 + 4)^{\frac{1}{5}}$$

$$\frac{dy}{dx} = \frac{1}{5} (3x^2 + 4)^{\frac{1}{5}-1} \cdot 6x = \frac{6}{5} x (3x^2 + 4)^{-\frac{4}{5}}$$



## تابع: الحلول:

$$ix. \quad y = (4x^2 + 5x - 2)^8$$

الحل:

$$\begin{aligned} \frac{dy}{dx} &= 8(4x^2 + 5x - 2)^7 \cdot (8x + 5) \\ &= (64x + 40)(4x^2 + 5x - 2)^7 \end{aligned}$$



## تابع: الحلول:

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$$iii. \quad y = \frac{u^2 + 1}{u - 2}, \quad u = 3x + 7$$

الحل:

$$\begin{aligned} \frac{dy}{du} &= \frac{(u-2).2u - (u^2+1).1}{(u-2)^2} = \frac{2u^2 - 4u - u^2 - 1}{(u-2)^2} \\ &= \frac{u^2 - 4u - 1}{(u-2)^2} \end{aligned}$$

$$\frac{du}{dx} = 3$$



## تابع: الحلول:

$$\begin{aligned}\frac{dy}{dx} &= \frac{dy}{du} \cdot \frac{du}{dx} = \frac{u^2 - 4u - 1}{(u - 2)^2} \times 3 = \frac{3(3x + 7)^2 - 12(3x + 7) - 3}{(3x + 7 - 2)^2} \\&= \frac{3(3x + 7)^2 - 36x - 87}{(3x + 5)^2} \\&= \frac{3(9x^2 + 42x + 49) - 36x - 87}{(3x + 5)^2} \\&= \frac{27x^2 + 126x + 147 - 36x - 87}{(3x + 5)^2} \\&= \frac{27x^2 + 96x + 60}{(3x + 5)^2}\end{aligned}$$



## تابع: الحلول:

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الحل:

$$iv. \quad y = \frac{1}{3x+1}$$

$$y' = \frac{-1 \times 3}{(3x+1)^2} = \frac{-3}{(3x+1)^2}$$

$$y'' = \frac{-(-3)(2(3x+1) \times 3)}{(3x+1)^4} = \frac{18(3x+1)}{(3x+1)^4} = \frac{18}{(3x+1)^3}$$



## تابع: الحلول:

$$y''' = \frac{-18 \times 3(3x+1)^2 \times 3}{(3x+1)^6} = \frac{-162}{(3x+1)^4}$$

