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$$1) 2 \quad 2) 4 \quad 3) 3x^2 - 12x^3$$

$$4) \frac{1}{3} \cdot x^3 = \cancel{3} \cdot \frac{1}{\cancel{3}} \cdot x^2 = x^2$$

$$5) 2x^2 + x^{-2} = 4x - 2 \cdot x^{-2}$$

$$6) \frac{x}{2+x} = \frac{1 \cdot (2+x) - x \cdot (1)}{(2+x)^2} = \frac{2+x-x}{(2+x)^2} = \frac{2}{(2+x)^2}$$

$$7) 4x \cdot x + (2x^2 + 5) \cdot 1 = 4x^2 + 2x^2 + 5 = 6x^2 + 5$$

$$8) 4x \cdot (3x^2 + 6x) + (2x^2 - 1) \cdot (6x + 6) \\ = 12x^3 + 24x^2 + 12x^3 + 12x^2 - 6x - 6 \\ = 24x^3 + 36x^2 - 6x - 6$$

$$9) \frac{2 \cdot (x+3) - (2x-1) \cdot 1}{(x+3)^2} = \frac{2x+6-2x+1}{(x+3)^2} = \frac{7}{(x+3)^2}$$

$$10) \frac{1}{2 \cdot \sqrt{x+2}}$$

$$11) (x^2 + 2x)^{2/3} = \frac{1}{3} \cdot (x^2 + 2x)^{2/3} \cdot (2x + 2)$$

$$= \frac{1}{3 \cdot (x^2 + 2x)^{2/3}} \cdot (2x + 2)$$

$$= \frac{2x + 2}{3 \cdot \sqrt[3]{(x^2 + 2x)^2}}$$

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$$12) 7x \cdot (x^2+x)^{1/3} = 7 \cdot (x^2+x)^{1/3} + 7x \cdot \left(\frac{1}{3} \cdot (x^2+x)^{-2/3} \cdot (2x+1) \right)$$

$$= 7 \cdot \left(\sqrt[3]{x^2+x} + \frac{x \cdot (2x+1)}{3 \cdot \sqrt[3]{(x^2+x)^2}} \right)$$

$$13) \frac{1 \cdot (x-1) - (x+1) \cdot 1}{(x-1)^2} = \frac{(x-1) - (x+1)}{(x-1)^2} = \frac{x-1-x-1}{(x-1)^2}$$

$$= \frac{-2}{(x-1)^2}$$

$$14) -x^{-2} - 6x + \frac{3x^2}{2} = -\frac{1}{x^2} - 6x + \frac{3x^2}{2}$$

$$15) (2 \cdot (x^3+2x) \cdot (3x^2+2)) \cdot (x+4)^2 + (x^3+2x)^2 \cdot (3 \cdot (x+4)^2)$$

$$16) \frac{2 \cdot (x^2+x) \cdot (2x+1) \cdot (x^3+3) - (x^2+x)^2 \cdot 3x^2}{(x^3+3)^2}$$

$$2 \cdot (x^2+x) \cdot (2x+1) \cdot (x^3+3) = 2 \cdot (2x^3+x^2+2x^2+x) \cdot (x^3+3)$$

$$= 2 \cdot (2x^6+x^5+2x^5+x^4+6x^3+3x^2+6x^2+3x)$$

$$= 4x^6+2x^5+4x^5+2x^4+12x^3+6x^2+12x^2+6x$$

$$3x^2 \cdot (x^2+x)^2 = 3x^2 \cdot (x^4+2x \cdot x^2+x^2)$$

$$= -(3x^6+6x^3 \cdot x^4+3x^4)$$

$$16) = \frac{x^6 - x^4 + 12x^3 + 18x^2 + 6x}{(x^3+3)^2}$$

II

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$$1) 3 \cdot (7x+3)^2 \cdot 7 = 21 \cdot (7x+3)^2$$

$$2) 6x$$

$$3) 8x - 5$$

$$4) 3$$

$$5) \frac{3}{4} \cdot (8-5x)^{-1/4} \cdot -5 = \frac{3 \cdot -5}{4 \cdot (8-5x)^{1/4}} = \frac{-15}{4 \cdot (8-5x)^{1/4}}$$

$$6) 4x$$

$$7) \frac{7}{5} \cdot (6-3x-x^2)^{2/5} \cdot (-3-2x)$$

$$= \frac{7 \cdot (6-3x-x^2)^{2/5} \cdot (-2x-3)}{5}$$

$$= \frac{7 \cdot (6-3x-x^2)^{2/5} \cdot (-2x-3)}{5}$$

$$8) \frac{4x^3 - 9x^2 - 5}{2 \cdot \sqrt{x^4 + 3x^3 - 5x}}$$

$$9) \frac{2 \cdot (3x-2) - (2x+3) \cdot 3}{(3x-2)^2} = \frac{6x-4-6x-9}{(3x-2)^2}$$

$$= \frac{-13}{(3x-2)^2} \quad 10) \frac{1 \cdot (x-1) - x \cdot 1}{(x-1)^2} = \frac{-1}{(x-1)^2}$$