

## Review for Test

Date \_\_\_\_\_ Period \_\_\_\_\_

**Differentiate each function with respect to  $x$ .**

1)  $y = e^{3x^2}$

2)  $y = e^{3x^4}$

3)  $y = e^{4x^3}$

4)  $y = e^{3x^5}$

5)  $y = e^{x^4}$

6)  $y = (5x^3 + 2) \cdot e^{3x^5}$

7)  $y = e^{2x^2}$

8)  $y = e^{5x^4}(2x^2 + 5)$

9)  $y = (5x^5 - 3) \cdot e^{x^2}$

10)  $y = (3x^4 - 4) \cdot e^{2x^2}$

11)  $y = \frac{e^{x^3}}{e^{x^4+5}}$

12)  $y = \frac{e^{x^3}}{e^{5x^2-3}}$

13)  $y = \frac{e^{4x^5}}{e^{5x^4+1}}$

14)  $y = \frac{e^{5x^2}}{e^{5x^4+3}}$

15)  $y = \ln 5x^4$

16)  $y = \ln 2x^4$

17)  $y = \ln 4x^4$

18)  $y = \ln 3x^4$

19)  $y = \ln 3x^5$

20)  $y = \ln \left( \frac{5x^2}{2x^3 + 5} \right)^5$

21)  $y = \ln \left( \frac{5x^4}{5x^2 + 4} \right)^4$

22)  $y = \ln \left( \frac{5x^2}{x^4 + 3} \right)^5$

23)  $y = \ln \left( \frac{3x^4}{3x^5 - 4} \right)^4$

24)  $y = \ln \left( \frac{3x^2}{x^5 + 4} \right)^5$

## Answers to Review for Test (ID: 1)

- $$1) \frac{dy}{dx} = e^{3x^2} \cdot 6x$$
- $$2) \frac{dy}{dx} = e^{3x^4} \cdot 12x^3$$
- $$3) \frac{dy}{dx} = e^{4x^3} \cdot 12x^2$$
- $$4) \frac{dy}{dx} = e^{3x^5} \cdot 15x^4$$
- $$5) \frac{dy}{dx} = e^{x^4} \cdot 4x^3$$
- $$6) \frac{dy}{dx} = (5x^3 + 2) \cdot e^{3x^5} \cdot 15x^4 + e^{3x^5} \cdot 15x^2$$
- $$7) \frac{dy}{dx} = e^{2x^2} \cdot 4x$$
- $$= 15x^2 e^{3x^5} (5x^5 + 2x^2 + 1)$$
- $$8) \frac{dy}{dx} = e^{5x^4} \cdot 4x + (2x^2 + 5) \cdot e^{5x^4} \cdot 20x^3$$
- $$9) \frac{dy}{dx} = (5x^5 - 3) \cdot e^{x^2} \cdot 2x + e^{x^2} \cdot 25x^4$$
- $$= 4xe^{5x^4} (1 + 10x^4 + 25x^2)$$
- $$= xe^{x^2} (10x^5 - 6 + 25x^3)$$
- $$10) \frac{dy}{dx} = (3x^4 - 4) \cdot e^{2x^2} \cdot 4x + e^{2x^2} \cdot 12x^3$$
- $$11) \frac{dy}{dx} = e^{x^3 - (x^4 + 5)} (3x^2 - 4x^3)$$
- $$= 4xe^{2x^2} (3x^4 - 4 + 3x^2)$$
- $$= x^2 e^{x^3 - x^4 - 5} (3 - 4x)$$
- $$12) \frac{dy}{dx} = e^{x^3 - (5x^2 - 3)} (3x^2 - 10x)$$
- $$13) \frac{dy}{dx} = e^{4x^5 - (5x^4 + 1)} (20x^4 - 20x^3)$$
- $$= xe^{x^3 - 5x^2 + 3} (3x - 10)$$
- $$= 20x^3 e^{4x^5 - 5x^4 - 1} (x - 1)$$
- $$14) \frac{dy}{dx} = e^{5x^2 - (5x^4 + 3)} (10x - 20x^3)$$
- $$15) \frac{dy}{dx} = \frac{1}{5x^4} \cdot 20x^3$$
- $$16) \frac{dy}{dx} = \frac{1}{2x^4} \cdot 8x^3$$
- $$= 10xe^{5x^2 - 5x^4 - 3} (1 - 2x^2)$$
- $$= \frac{4}{x}$$
- $$= \frac{4}{x}$$
- $$17) \frac{dy}{dx} = \frac{1}{4x^4} \cdot 16x^3$$
- $$18) \frac{dy}{dx} = \frac{1}{3x^4} \cdot 12x^3$$
- $$19) \frac{dy}{dx} = \frac{1}{3x^5} \cdot 15x^4$$
- $$= \frac{4}{x}$$
- $$= \frac{4}{x}$$
- $$= \frac{5}{x}$$
- $$20) \frac{dy}{dx} = 5 \left( \frac{1}{5x^2} \cdot 10x - \frac{1}{2x^3 + 5} \cdot 6x^2 \right)$$
- $$21) \frac{dy}{dx} = 4 \left( \frac{1}{5x^4} \cdot 20x^3 - \frac{1}{5x^2 + 4} \cdot 10x \right)$$
- $$= \frac{10(-x^3 + 5)}{x(2x^3 + 5)}$$
- $$= \frac{8(5x^2 + 8)}{x(5x^2 + 4)}$$
- $$22) \frac{dy}{dx} = 5 \left( \frac{1}{5x^2} \cdot 10x - \frac{1}{x^4 + 3} \cdot 4x^3 \right)$$
- $$23) \frac{dy}{dx} = 4 \left( \frac{1}{3x^4} \cdot 12x^3 - \frac{1}{3x^5 - 4} \cdot 15x^4 \right)$$
- $$= \frac{10(-x^4 + 3)}{x(x^4 + 3)}$$
- $$= \frac{4(-3x^5 - 16)}{x(3x^5 - 4)}$$
- $$24) \frac{dy}{dx} = 5 \left( \frac{1}{3x^2} \cdot 6x - \frac{1}{x^5 + 4} \cdot 5x^4 \right)$$
- $$= \frac{5(-3x^5 + 8)}{x(x^5 + 4)}$$