Practice for the week of April 20-24, 2020

Date_____

Differentiate each function with respect to *x*.

1) $y = \cos 4x^4$

2) $y = \sec 5x^2$

3) $y = \cot 5x^4$

4) $y = \sin 3x^2$

5) $y = \tan 4x^4$

6) $y = \sin x^5$

7) $y = \cos 5x^3$

8) $y = \csc 2x^5$

9) $y = \cos x^3$

10) $y = \sec 3x^4$

11) $y = (5x^2 + 2)\tan 2x^3$

12) $y = \sin 3x^2 \cdot (-3x^3 + 2)$

13) $y = \sin x^5 \cdot (2x^3 + 5)$

14) $y = \cos x^3 \cdot \left(2x^5 + 1\right)$

15) $y = \left(-2x^3 + 1\right)\sin 5x^2$

16) $y = \dfrac{-5x^3 + 4}{\tan 3x^2}$

17) $y = \dfrac{\sec 5x^3}{-4x^2 - 5}$

18) $y = \tan 3x^5$

19) $y = \tan \dfrac{2x^5}{x^4 + 3}$

20) $y = \dfrac{\cot 4x^3}{4x^4 - 3}$

Answers to Practice for the week of April 20-24, 2020 (ID: 1)

1) $\frac{dy}{dx} = -\sin 4x^4 \cdot 16x^3$
$= -16x^3 \sin 4x^4$

2) $\frac{dy}{dx} = \sec 5x^2 \tan 5x^2 \cdot 10x$
$= 10x \sec 5x^2 \tan 5x^2$

3) $\frac{dy}{dx} = -\csc^2 5x^4 \cdot 20x^3$
$= -20x^3 \csc^2 5x^4$

4) $\frac{dy}{dx} = \cos 3x^2 \cdot 6x$
$= 6x \cos 3x^2$

5) $\frac{dy}{dx} = \sec^2 4x^4 \cdot 16x^3$
$= 16x^3 \sec^2 4x^4$

6) $\frac{dy}{dx} = \cos x^5 \cdot 5x^4$
$= 5x^4 \cos x^5$

7) $\frac{dy}{dx} = -\sin 5x^3 \cdot 15x^2$
$= -15x^2 \sin 5x^3$

8) $\frac{dy}{dx} = -\csc 2x^5 \cot 2x^5 \cdot 10x^4$
$= -10x^4 \csc 2x^5 \cot 2x^5$

9) $\frac{dy}{dx} = -\sin x^3 \cdot 3x^2$
$= -3x^2 \sin x^3$

10) $\frac{dy}{dx} = \sec 3x^4 \tan 3x^4 \cdot 12x^3$
$= 12x^3 \sec 3x^4 \tan 3x^4$

11) $\frac{dy}{dx} = \left(5x^2 + 2\right) \cdot \sec^2 2x^3 \cdot 6x^2 + \tan 2x^3 \cdot 10x$
$= 2x\left(15x^3 \sec^2 2x^3 + 6x \sec^2 2x^3 + 5\tan 2x^3\right)$

12) $\frac{dy}{dx} = \sin 3x^2 \cdot -9x^2 + \left(-3x^3 + 2\right) \cdot \cos 3x^2 \cdot 6x$
$= 3x\left(-3x \sin 3x^2 - 6x^3 \cos 3x^2 + 4\cos 3x^2\right)$

13) $\frac{dy}{dx} = \sin x^5 \cdot 6x^2 + \left(2x^3 + 5\right) \cdot \cos x^5 \cdot 5x^4$
$= x^2\left(6\sin x^5 + 10x^5 \cos x^5 + 25x^2 \cos x^5\right)$

14) $\frac{dy}{dx} = \cos x^3 \cdot 10x^4 + \left(2x^5 + 1\right) \cdot -\sin x^3 \cdot 3x^2$
$= x^2\left(10x^2 \cos x^3 - 6x^5 \sin x^3 - 3\sin x^3\right)$

15) $\frac{dy}{dx} = \left(-2x^3 + 1\right) \cdot \cos 5x^2 \cdot 10x + \sin 5x^2 \cdot -6x^2$
$= 2x\left(-10x^3 \cos 5x^2 + 5\cos 5x^2 - 3x \sin 5x^2\right)$

16) $\frac{dy}{dx} = \frac{\tan 3x^2 \cdot -15x^2 - \left(-5x^3 + 4\right) \cdot \sec^2 3x^2 \cdot 6x}{\tan^2 3x^2}$
$= \frac{3x\left(-5x \tan 3x^2 + 10x^3 \sec^2 3x^2 - 8\sec^2 3x^2\right)}{\tan^2 3x^2}$

17) $\frac{dy}{dx} = \frac{\left(-4x^2 - 5\right) \cdot \sec 5x^3 \tan 5x^3 \cdot 15x^2 - \sec 5x^3 \cdot -8x}{\left(-4x^2 - 5\right)^2}$
$= \frac{x \sec 5x^3 \cdot \left(-60x^3 \tan 5x^3 - 75x \tan 5x^3 + 8\right)}{\left(-4x^2 - 5\right)^2}$

18) $\frac{dy}{dx} = \sec^2 3x^5 \cdot 15x^4$
$= 15x^4 \sec^2 3x^5$

19) $\frac{dy}{dx} = \sec^2 \frac{2x^5}{x^4 + 3} \cdot \frac{\left(x^4 + 3\right) \cdot 10x^4 - 2x^5 \cdot 4x^3}{\left(x^4 + 3\right)^2}$
$= \frac{2x^4 \sec^2 \frac{2x^5}{x^4 + 3}\left(x^4 + 15\right)}{\left(x^4 + 3\right)^2}$

20) $\frac{dy}{dx} = \frac{\left(4x^4 - 3\right) \cdot -\csc^2 4x^3 \cdot 12x^2 - \cot 4x^3 \cdot 16x^3}{\left(4x^4 - 3\right)^2}$
$= \frac{4x^2\left(-12x^4 \csc^2 4x^3 + 9\csc^2 4x^3 - 4x \cot 4x^3\right)}{\left(4x^4 - 3\right)^2}$