

Power, Constant, and Sum Rules

Differentiate each function with respect to the given variable.

1. $y = -2 \cdot x$

2. $y = -7$

3. $y = \frac{9}{8} \cdot x^{\frac{-7}{5}}$

4. $y = -19$

5. $y = x^5 - 1 \cdot x^4 + 6 \cdot x^3 + 6 \cdot x - 9$

6. $y = \frac{-1}{2} \cdot x^{\frac{11}{5}}$

7. $y = -1$

8. $y = 3$

9. $y = \frac{-16}{x}$

10. $y = \frac{-17}{20} \cdot x^{\frac{-7}{10}}$

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Differentiate each function with respect to the given variable.

11. $y = \frac{8}{x^3}$

12. $y = 2 \cdot x^{\frac{3}{4}}$

13. $y = \frac{1}{x^2}$

14. $y = -7 \cdot x^4 + 7 \cdot x^3 - 7 \cdot x^2 - 2$

15. $y = \frac{-7}{x^3}$

16. $y = -6 \cdot x$

17. $y = \frac{-17}{5} \cdot x^{\frac{-11}{8}}$

18. $y = -12$

19. $y = x^4 + 2 \cdot x^3 - 7 \cdot x + 7$

20. $y = \frac{4}{x^3}$

Power, Constant, and Sum Rules

Answer Key

Differentiate each function with respect to the given variable.

1. $y = -2 \cdot x$

$$dy/dx = -2$$

2. $y = -7$

$$dy/dx = 0$$

3. $y = \frac{9}{8} \cdot x^{\frac{-7}{5}}$

$$dy/dx = \frac{-63}{40} \cdot x^{\frac{-12}{5}}$$

Derivative domain: $x \neq 0$

4. $y = -19$

$$dy/dx = 0$$

5. $y = x^5 - 1 \cdot x^4 + 6 \cdot x^3 + 6 \cdot x - 9$

$$dy/dx = 5 \cdot x^4 - 4 \cdot x^3 + 18 \cdot x^2 + 6$$

6. $y = \frac{-1}{2} \cdot x^{\frac{11}{5}}$

$$dy/dx = \frac{-11}{10} \cdot x^{\frac{6}{5}}$$

7. $y = -1$

$$dy/dx = 0$$

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Answer Key

Differentiate each function with respect to the given variable.

8. $y = 3$

$$dy/dx = 0$$

9. $y = \frac{-16}{x}$

$$dy/dx = \frac{16}{x^2}$$

Derivative domain: $x \neq 0$

10. $y = \frac{-17}{20} \cdot x^{\frac{-7}{10}}$

$$dy/dx = \frac{119}{200} \cdot x^{\frac{-17}{10}}$$

Derivative domain: $x > 0$

11. $y = \frac{8}{x^3}$

$$dy/dx = \frac{-24}{x^4}$$

Derivative domain: $x \neq 0$

12. $y = 2 \cdot x^{\frac{3}{4}}$

$$dy/dx = \frac{3}{2} \cdot x^{\frac{-1}{4}}$$

Derivative domain: $x > 0$

13. $y = \frac{1}{x^2}$

$$dy/dx = \frac{-2}{x^3}$$

Derivative domain: $x \neq 0$

14. $y = -7 \cdot x^4 + 7 \cdot x^3 - 7 \cdot x^2 - 2$

$$dy/dx = -28 \cdot x^3 + 21 \cdot x^2 - 14 \cdot x$$

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Differentiate each function with respect to the given variable.

15. $y = \frac{-7}{x^3}$
 $dy/dx = \frac{21}{x^4}$
 Derivative domain: $x \neq 0$

16. $y = -6 \cdot x$
 $dy/dx = -6$

17. $y = \frac{-17}{5} \cdot x^{\frac{-11}{8}}$
 $dy/dx = \frac{187}{40} \cdot x^{\frac{-19}{8}}$
 Derivative domain: $x > 0$

18. $y = -12$
 $dy/dx = 0$

19. $y = x^4 + 2 \cdot x^3 - 7 \cdot x + 7$
 $dy/dx = 4 \cdot x^3 + 6 \cdot x^2 - 7$

20. $y = \frac{4}{x^3}$
 $dy/dx = \frac{-12}{x^4}$
 Derivative domain: $x \neq 0$