Calculus 1 Workbook

Other derivatives

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MATH

INVERSE TRIGONOMETRIC DERIVATIVES

■ 1. Find $f'(t)$.

$$f(t) = 4\sin^{-1}\left(\frac{t}{4}\right)$$

■ 2. Find $g'(t)$.

$$g(t) = -6\cos^{-1}(2t+3)$$

■ 3. Find $h'(t)$.

$$h(t) = 2\sec^{-1}(6t^2+3) - 8\cot^{-1}\left(\frac{t^3}{3}\right)$$

■ 4. Find the derivative.

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

■ 5. Find the derivative.

$$y = \frac{\sin^{-1}\left(x + \frac{x^2}{2}\right)}{1 + x}$$

6. Find the derivative.

$$y = \frac{1 - \sin^{-1}(2x)}{1 + \cos^{-1}(2x)}$$

HYPERBOLIC DERIVATIVES

1. Find $f'(\theta)$ if $f(\theta) = 3\sinh(2\theta^2 - 5\theta + 2)$.

2. Find $g'(\theta)$ if $g(\theta) = 2\cosh(5\theta^{\frac{3}{2}} + 6\theta)$.

3. Find $h'(\theta)$ if $h(\theta) = 9\tanh(3\theta^2 - \theta^{\sqrt{3}})$.

4. Find the derivative of the hyperbolic function.

$$y = \coth(x^2 + 3x) - x^4\operatorname{csch}(x^2)$$

5. Find the derivative of the hyperbolic function.

$$y = \frac{2x + 3e^x}{\cosh(x^{-5})}$$

6. Find the derivative of the hyperbolic function.

$$y = \tanh(x^2)\tan(x^2)$$

INVERSE HYPERBOLIC DERIVATIVES

1. Find $f'(t)$ if $f(t) = 7\sinh^{-1}(5t^4)$.

2. Find $g'(t)$ if $g(t) = 4\cosh^{-1}(2t - 3)$.

3. Find $h'(t)$ if $h(t) = 9\tanh^{-1}(-7t + 2)$.

4. Find the derivative of the inverse hyperbolic function.

$$y = \cosh^{-1}(3x^3 + 4x^2) - x^2\sinh^{-1}(e^x)$$

5. Find the derivative of the inverse hyperbolic function.

$$y = \left(\operatorname{csch}^{-1}\left(\frac{x^2}{3x^4 + 1}\right)\right)^5$$

6. Find the derivative of the inverse hyperbolic function.

$$y = -\frac{\coth^{-1} x}{\tanh^{-1}(2x^4)}$$

LOGARITHMIC DIFFERENTIATION

■ 1. Use logarithmic differentiation to find dy/dx.

$$y = (\ln x)^{\ln(x^2)}$$

■ 2. Use logarithmic differentiation to find dy/dx.

$$y = 5x^4 e^{3x} \sqrt[4]{x}$$

■ 3. Use logarithmic differentiation to find dy/dx.

$$y = (7 - 4x^3)^{x^2+9} \sqrt[3]{1 - \cos(3x)}$$

■ 4. Use logarithmic differentiation to find dy/dx.

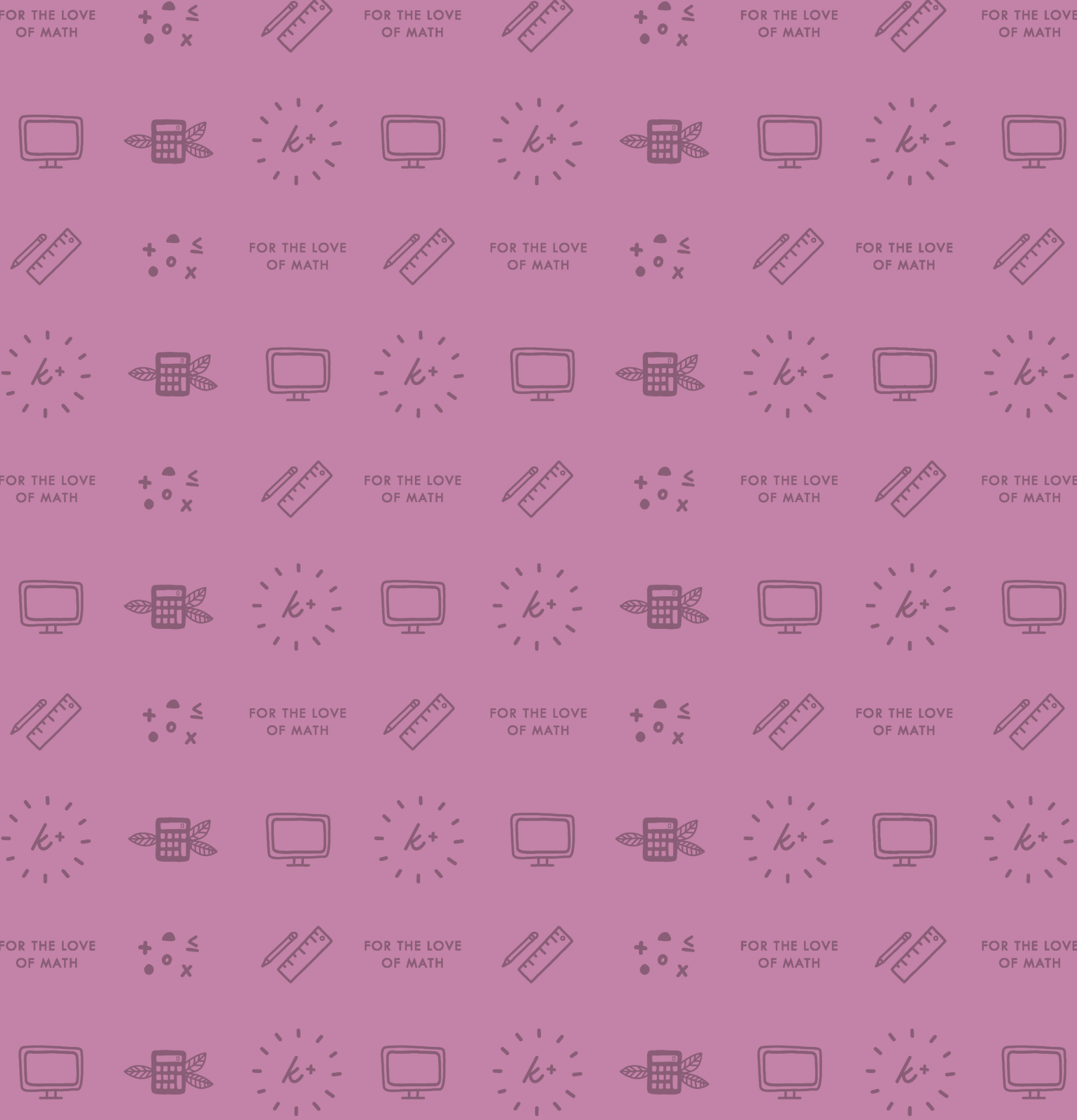
$$y = \frac{(2e)^{\cos x}}{(3e)^{\sin x}}$$

■ 5. Use logarithmic differentiation to find dy/dx.

$$y = e^x (2e)^{\sin x} (3e)^{\cos x}$$

6. Use logarithmic differentiation to find dy/dx.

$$y = \frac{(1-2x)^{\sin x}}{(x^3-2x)^{5x+7}}$$



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