Trig Derivative Practice

Find the 1st and 2nd derivative of each of the following sine models.

1. $R(x) = 2.1\sin(0.45x - 1.84) + 11.6$ hundred dollars when x dinglehoppers are sold

2. $S(x) = -4.2\sin(0.18x + 2.5) + 14.2$ thousand snarfblats x years after 1990

Find $\frac{dy}{dx}$ *for each of the following.*

3. $y = \sin(5x^3 - 7.2x^2 + 3.8)$

4. $y = e^{\sin(x^2)}$

5. $y = \ln(2^x + \sin(5x))$

6. $y = (\sin(5x + e^x))^4$

7. $y = \sin(\sqrt{x})$

8. $y = \cos(\ln(5x + 2))$

9. $y = \sin(x^2)\cos(5^x)$

10. $y = e^{x^2}\cos(8x - 4.2)$

Answers

1. $R'(x) = 0.945\cos(0.45x - 1.84)$ hundred dollars per dinglehopper

$R''(x) = -0.42525\sin(0.45x - 1.84)$ (hundred dollars per dinglehopper) per dinglehopper

2. $S'(x) = -0.756\cos(0.18x + 2.5)$ thousand snarfblats per year

$S''(x) = 0.13608\sin(0.18x + 2.5)$ (thousand snarfblats per year) per year

3. $\frac{dy}{dx} = (15x^2 - 14.4x)\cos(5x^3 - 7.2x^2 + 3.8)$

4. $\frac{dy}{dx} = 2x\cos(x^2)e^{\sin(x^2)}$

5. $\frac{dy}{dx} = \frac{2^x(\ln 2) + 5\cos(5x)}{2^x + \sin(5x)}$

6. $\frac{dy}{dx} = 4(5 + e^x)(\sin(5x + e^x))^3\cos(5x + e^x)$

7. $\frac{dy}{dx} = \frac{\cos(\sqrt{x})}{2\sqrt{x}}$

8. $\frac{dy}{dx} = \frac{-5\sin(\ln(5x + 2))}{5x + 2}$

9. $\frac{dy}{dx} = 2x\cos(x^2)\cos(5^x) - \sin(x^2)(5^x \ln 5)\sin(5^x)$

10. $\frac{dy}{dx} = e^{x^2}(2x\cos(8x - 4.2) - 8\sin(8x - 4.2))$