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1. 1/1 points | Previous Answers | SEscAKE2.2.7.803 | My Notes | Ask Your Teacher

Each side of a square is increasing at a rate of 2 cm/s. At what rate is the area of the square increasing when the area of the square is 9 cm²?

12 cm²/s

Solution or Explanation
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2. 1/1 points | Previous Answers | SEscAKE2.2.7.804.M | My Notes | Ask Your Teacher

The length of a rectangle is increasing at a rate of 9 cm/s and its width is increasing at a rate of 7 cm/s. When the length is 15 cm and the width is 4 cm, how fast is the area of the rectangle increasing?

141 cm²/s

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3. 1/1 points | Previous Answers | SEscAKE2.2.7.805.M | My Notes | Ask Your Teacher

A cylindrical tank with radius 5 m is being filled with water at a rate of 4 m³/min. How fast is the height of the water increasing?

4/25π m/min

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4. 1/1 points | Previous Answers | SEscAKE2.2.7.806 | My Notes | Ask Your Teacher

The radius of a sphere is increasing at a rate of 3 mm/s. How fast is the volume increasing when the diameter is 40 mm?

4800π mm³/s

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5. 2/2 points | Previous Answers | SEscAKE2.2.7.807 | My Notes | Ask Your Teacher

Suppose $y = \sqrt{2x+1}$, where x and y are functions of t .

(a) If $dy/dt = 12$, find dx/dt when $x = 4$.
 $\frac{dx}{dt} =$ 8/4

(b) If $dy/dt = 2$, find dx/dt when $x = 12$.
 $\frac{dx}{dt} =$ 10

Solution or Explanation
 (a) $y = \sqrt{2x+1}$ and $\frac{dy}{dt} = 12 \Rightarrow \frac{dy}{dx} \frac{dx}{dt} = \frac{dy}{dx} \frac{dx}{dt} = \frac{1}{2}(2x+1)^{-1/2} \cdot 2 \cdot 12 = \frac{12}{\sqrt{2x+1}}$. When $x = 4$, $\frac{dy}{dx} = \frac{12}{\sqrt{9}} = 4$.
 (b) $y = \sqrt{2x+1} \Rightarrow y^2 = 2x+1 \Rightarrow 2x = y^2 - 1 \Rightarrow x = \frac{1}{2}y^2 - \frac{1}{2}$ and $\frac{dx}{dt} = 2 \Rightarrow \frac{dx}{dy} \frac{dy}{dt} = 2 \Rightarrow \frac{dx}{dy} \frac{dy}{dt} = y \cdot 2 = 2y$. When $x = 12$, $y = \sqrt{25} = 5$, so $\frac{dx}{dt} = 2(5) = 10$.

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6. 1/1 points | Previous Answers | SEscAKE2.2.7.811 | My Notes | Ask Your Teacher

If a snowball melts so that its surface area decreases at a rate of 2 cm²/min, find the rate at which the diameter decreases when the diameter is 10 cm.

1/10π cm/min

Solution or Explanation
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7. 1/1 points | Previous Answers | SEscAKE2.2.7.814 | My Notes | Ask Your Teacher

A street light is mounted at the top of a 15-ft-tall pole. A man 6 ft tall walks away from the pole with a speed of 4 ft/s along a straight path. How fast is the tip of his shadow moving when he is 40 ft from the pole?

20/3 ft/s

Solution or Explanation
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8. 1/1 points | Previous Answers | SEscAKE2.2.7.816.M | My Notes | Ask Your Teacher

A spotlight on the ground shines on a wall 12 m away. If a man 2 m tall walks toward the spotlight toward the building at a speed of 2.1 m/s, how fast is the length of his shadow on the building decreasing when he is 4 m from the building? (Round your answer to one decimal place.)

0.8 m/s

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9. 1/1 points | Previous Answers | SEscAKE2.2.7.824 | My Notes | Ask Your Teacher

Water is leaking out of an inverted conical tank at a rate of 6,500 cm³/min at the same time that water is being pumped into the tank at a constant rate. The tank has height 6 m and the diameter at the top is 4 m. If the water level is rising at a rate of 20 cm/min when the height of the water is 2 m, find the rate at which water is being pumped into the tank. (Round your answer to the nearest integer.)

285,753 cm³/min

Solution or Explanation
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10. 1/1 points | Previous Answers | SEscAKE2.2.7.829 | My Notes | Ask Your Teacher

Two sides of a triangle are 10 m and 11 m in length and the angle between them is increasing at a rate of 0.06 rad/s. Find the rate at which the area of the triangle is increasing when the angle between the sides of fixed length is $\frac{\pi}{3}$ rad.

33/20 m²/s

Solution or Explanation
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