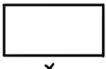


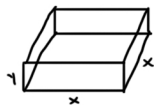
3.6

- 1) Volume is 539 ft^3 . Height is 4ft greater than the length and width. $SA = 357 \text{ ft}^2$

4 of these



$$y \cdot x \cdot x = x^2 y$$




$$V = 539 = x^2 y$$

$$y = x + 4 = x^2(x + 4)$$

$$539 = x^3 + 4x^2$$

2 of these



$$x \cdot x = x^2$$

Couldn't solve.
Come back to.
Answers were 7 and 11.

$$SA = 357 = 4xy + 2x^2$$

$$357 = 4x(x + 4) + 2x^2$$

$$357 = 4x^2 + 16x + 2x^2$$

$$6x^2 + 16x - 357$$

- 2) Circular pattern. radius = 17ft. Use 3.14 for π

$$A = \pi r^2$$

$$A = (3.14)(17)^2$$

- 3) Triangle leg 9 km and hypotenuse 16 km. Find missing side



$$a^2 + b^2 = c^2$$

$$a^2 + b^2 = 16^2$$

$$81 + b^2 = 256$$

$$b^2 = 175$$

$$b = 13.228$$

- 4) $y = x^2 + 6$ and $\frac{dy}{dx} = 4$ when $x = 3$.

Find $\frac{dy}{dx}$ when $x = 3$

$$y^2 + x^2 = 16^2 \quad (\text{circle})$$

$$2y \cdot y' + 2x = 0$$

$$y = x^2 + 6 \quad x' = 4 \text{ when } x = 3$$

$$y' = 2x \cdot x' +$$

$$y' = 2x \cdot x'$$

$$\frac{dy}{dx} = 24$$

- 5) Evaluate $\frac{dy}{dt}$ for $4xy - 4x + 5y^3 = -45$. $\frac{dx}{dt} = -15$, $x = 5$, $y = -1$

$$4xy - 4x + 5y^3 = -45 \quad \begin{matrix} x' = -15 \\ y = -1 \\ x = 5 \end{matrix}$$

$$4(1 \cdot x' + y \cdot y') - 4 \cdot x' + 5 \cdot 3y^2 \cdot y' = 0$$

$$4(1 \cdot (-1) + y' \cdot 5) - 4(15) + 15(1) y' = 0$$

$$-40 + 20y' - 60 + 15y' = 0$$

$$35y' - 100 = 0$$

$$y' = \frac{100}{35} = \frac{20}{7}$$

$$y' = -\frac{20}{7}$$

5) y' for $y = (7 + 6x - 7x^2)e^x$

$$y' = 0 + (6 - 14x)e^x + (7 + 6x - 7x^2)e^x$$

$$= e^x(13 - 8x - 7x^2)$$

7) point is moving on graph $xy=42$. When $(6,7)$, x is increasing at 6 units per second. How much is y increasing per second?

$$x=6 \quad y=7 \quad 42 = xy$$

$$x'=6 \quad y'=? \quad \frac{d}{dx}(42) = \frac{d}{dx}(xy)$$

The y -coordinate is decreasing at 7 units per second.

$$0 = x' \cdot y + y' \cdot x$$

$$0 = 6 \cdot 7 + y' \cdot 6$$

$$= 42 + 6y'$$

$$\frac{-42}{6} = \frac{6y'}{6}$$

$$\boxed{-7 = y'}$$

8) rope being pulled at 4 ft per second. How fast is the distance between the dock and boat decreasing when it is 3 ft from the dock?



The distance between the dock and the boat is decreasing by

$$y' = 4$$

$$y = z = \sqrt{34}$$

$$x' = ?$$

$$x = 3$$

$$y^2 = a^2 + z^2$$

$$y = \sqrt{34}$$

$$y^2 = x^2 + b^2$$

$$y^2 = x^2 + 25$$

$$2 \cdot y \cdot y' = 2x \cdot x'$$

$$\sqrt{34} \cdot 4 = 3 \cdot x'$$

$$\frac{4\sqrt{34}}{3} = x'$$

$$\boxed{7.775 = x'}$$

9) Find dy for $y = \frac{4x^2 + 8}{x}$

$$dy = 4x + \frac{8}{x^2}$$

$$dy = 4x + 8x^{-1}$$

$$\boxed{dy = 4 - 8x^{-2}} \quad (4 - 8x^{-2}) dx$$