

MATH 1325

Chapter 12.5: Related Rates

WATER IS FLOWING AT THE RATE OF $5 \text{ m}^3/\text{MIN}$ INTO A TANK IN THE FORM OF A CONE OF ALTITUDE 20 M AND BASE RADIUS 10 M AND WITH ITS VERTEX DOWN. HOW FAST IS THE WATER LEVEL RISING WHEN THE WATER IS 8 M DEEP?

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GIVEN $3x^3 + 12y = 10xy$ WITH x AND y VARYING OVER TIME,
FIND $\frac{dy}{dt}$ WHEN $x = 2$, $y = 3$, AND $\frac{dx}{dt} = -4$.

IF A SNOWBALL IN THE SHAPE OF A SPHERE HAS A RADIUS OF 10 CM IS MELTING SUCH THAT ITS VOLUME IS DECREASING AT THE RATE OF $800\pi \frac{\text{cm}^3}{\text{hr}}$, FIND THE RATE OF CHANGE OF ITS RADIUS.

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CHARLOTTE IS FLYING A KITE WHICH IS 120 FT HIGH. SHE IS LETTING OUT THE STRING AT 10 FT/SEC. AT THE MOMENT WHEN 130 FT OF STRING HAVE BEEN LET OUT, FIND THE VELOCITY OF THE KITE.