EX 1:

Assume that sand allowed to pour onto a level surface will from a pile in the shape of a cone, with height equal to the diameter of the base. If sand is poured at 2 cubic meters per second, how fast is the height of the pile increasing when the base is 8 meters in diameter?

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EX 2:

A water tank has the shape of an inverted right-circular cone, with radius at the top 15 meters and depth 12 meters. Water is flowing into the tank at the rate of 2 cubic meters per minute. How fast is the depth of water in the tank increasing when the depth is 8 meters?

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EX 3:

A conical cup is 4 cm across and 6 cm deep. Water leaks out of the bottom at the rate of $2\ cm^3/sec$. How fast is the water level dropping when the height of the water is 3 cm?

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EX 4:

A man 6 feet tall walks at the rate of 5 ft/sec toward a street light that is 16 ft above the ground. At what rate is the tip of the shadow moving? At what rate is the length of his shadow changing when he is 10 feet from the base of the light?

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EX 5:

A pickpocket walking away from a 10 meter tall lamppost is 2 meters tall. He walks at a rate of 1.5 m/sec. How fast is his shadow growing when he is 5 meter from the lamppost?

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