

Math 181 Honors Quiz 8 Version A

1. A woman raises a bucket of cement to a platform 40 ft above her head by means of a rope 80 ft long that passes over a pulley on the platform. If she holds her end of the rope firmly at head level and walks away at 5 ft/s, how fast is the bucket rising when she is 30 ft away from the spot directly below the pulley?

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2. Find the following derivatives:

(i) $\frac{d}{dx} \tan\left(\frac{1}{4} \sin(5x^2 + 8x - 3)\right)$

(ii) $\frac{d}{dx} \left(\frac{5}{x} + \frac{3}{x^2} - \frac{1}{x^3}\right)$

(iii) $\frac{d}{dx} \operatorname{arcsec}(x^2 + 2)$

(iv) $\frac{d^2}{dx^2} \left(\frac{x^4 \cos x}{x^2 + 1}\right)$