

score	possible	problem
	20	1
	20	2
	20	3
	20	4
	20	5
	100	

Name: _____

Name: _____

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Name: _____

Work in groups of 3 or 4. Show your work. Acknowledge any help on these specific problems.

1. Solve each for x :

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(a) $e^{2x} - 3e^x + 2 = 0$

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(b) $\ln(x) + \ln(x - 1) = 1$

/20 2. Use a linear approximation to estimate $\sqrt[3]{1001}$.

/20 3. The edge of a cube was found to be 30 cm with a possible error in measurement of 0.1 cm. Use differentials to estimate

- the maximum possible error in computing the volume of the cube and
- the relative error in computing the surface area of the cube.

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4. A trough is 10m long and its ends have the shape of isosceles triangles that are 3m across at the top and have a height of 1m. The trough is being filled with water at a rate of $12\text{m}^3/\text{min}$. Draw and label a diagram illustrating this scenario. How fast is the water level rising when it is 0.5m deep?

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5. The top of a ladder slides down a vertical wall at a rate of 0.15 m/s . At the moment when the bottom of the ladder is 3 m from the wall, it slides away from the wall at a rate of 0.2 m/s . How long is the ladder?