

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

Name: _____

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

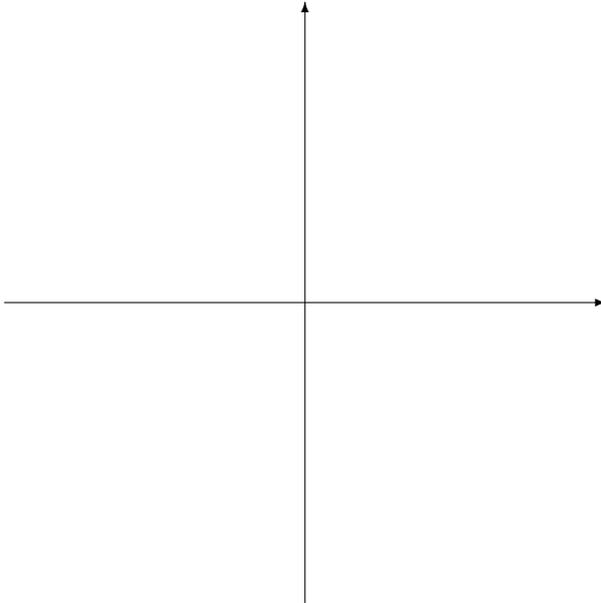
1. Solve each for x :

/10 (a) $e^{2x} - 3e^x + 2 = 0$

/10 (b) $\ln(x) + \ln(x - 1) = 1$

- /20 2. The radius of a spherical cell is observed to decrease at a rate of 2 units/second when that radius is 30 units long. How fast is the volume of the cell decreasing at that point?

- /20 3. Use a linear approximation to estimate $\sqrt{16.1}$. Illustrate your approximation graphically.



/20

4. A kite 100 feet above the ground moves horizontally at a speed of 8 feet per second. At what rate is the angle between the string and the horizontal decreasing when 200 feet of string has been let out?

- /20 5. The speed v of blood flowing along the central axis of an artery of radius R is given by Poiseuille's law

$$v(R) = cR^2$$

where c is a constant. If you can determine the radius of the artery within an accuracy of 5%, how accurate is your calculation of the speed?