

Name _____

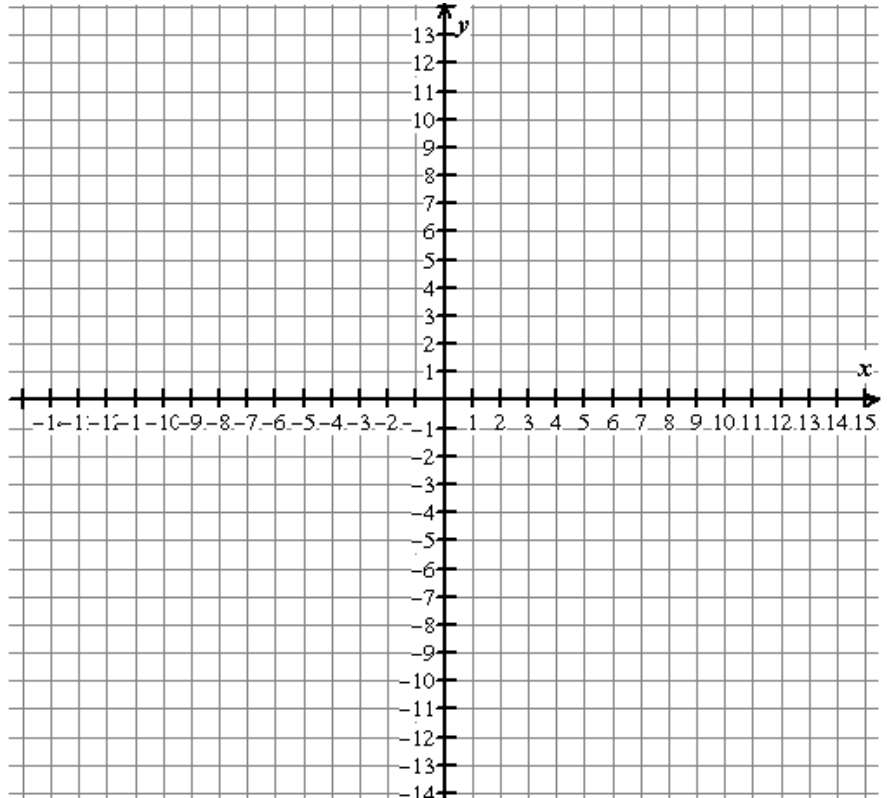
All problems are worth **25** points.

1. For the function $y = f(x) = \frac{x^2+3}{x-1}$

Determine

- i) all real roots (zeroes)
- ii) any asymptotes
- iii) the coordinates of any maxima or minima (and indicate whether they are absolute or local)
- iv) any points of inflection

then sketch the function.



2. Consider the function $y = f(x) = xe^{-x^2} = x \exp(-x^2)$.

a) What is the absolute minimum value of this function?

b) What is the absolute maximum value of this function?

c) How many points of inflection does this function have?

d) Determine the x coordinates of all of the inflection points.

Exam 4a Calculus I

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3. A meter stick (100 cm long) leans against a wall and begins to slip. The leading edge of the meter stick on the floor is moving 2 cm per second when it is 60 cm from the wall. At this same instant how fast is the edge against the wall moving down the wall?

4. A box is to have a square bottom of side s and a height h . The box has a floor, but no lid. What relationship between s and h gives the least surface area if the volume of the box is to be fixed at 4 cubic meters?

