

John Doe

Points

54 / 75**General feedback**

The assessment records each criterion's points as specified. The strongest work includes several correct computations and applications; the main losses arise from incorrect derivatives, omitted requested graph features, and limited method/proof evidence in selected tasks.

What to work on

1. For 4·1, add the requested graph sketch; for 4·4, 4·5 and 4·7, also state the inflection points, origin symmetry, and absence of a vertical asymptote.
2. For 15, give a proof of both inequalities for every $x > 0$; repeating the claim does not establish it.
3. For 3a, show the difference quotient from the definition, as required; simplifying it gives $1/(x+1)^2$.
4. For 5·2 and 5·3, explain why the stationary point is a minimum and give the outer poster dimensions after adding the margins: 9 by 18 inches.
5. For 1b, your seventh derivative has the wrong sine/cosine phase. Continue the derivative cycle carefully; the seventh derivative is $-128 \cos(2x)$.
6. For 2a, the derivative of $-5x$ is -5 , not $+5$, which changes the tangent line.
7. For 8b, include both endpoint values in the final evaluation; the lower endpoint changes the result to $2 \ln 2 - 3/4$.
8. For 9, the antiderivative is correct; show the substitution and integration steps as well to demonstrate the method required by the criterion.
9. For 12a, show the proportional-rate differential equation, solve it, and use the initial amount and half-life to determine the constants.
10. For 14d, show why the third derivative is bounded by 2 on $[0, 0.5]$ and substitute that into Taylor's inequality to justify the valid 0.0417 bound.

1a Derivative of $x^3 e^x$ **2 / 2****Keep doing**

- For 1a, your product-rule derivative is correct and clearly written.

1b Seventh derivative of $\sin(2x)$ **0 / 1****Where it went wrong**

- For 1b, your seventh derivative has the wrong sine/cosine phase. Continue the derivative cycle carefully; the seventh derivative is $-128 \cos(2x)$.

2a Tangent line**1 / 2****Where it went wrong**

- For 2a, the derivative of $-5x$ is -5 , not $+5$, which changes the tangent line.

2b Horizontal tangent**4 / 4****Keep doing**

- For 2b, your implicit differentiation and contradiction argument establish the absence of a horizontal tangent.

3a Derivative by definition**0 / 3****How to improve**

- For 3a, show the difference quotient from the definition, as required; simplifying it gives $1/(x+1)^2$.

3b Limit involving inverse tangent**1 / 1**

4 Sketch the graph**5 / 10****How to improve**

- For 4.1, add the requested graph sketch; for 4.4, 4.5 and 4.7, also state the inflection points, origin symmetry, and absence of a vertical asymptote.

5 Minimize poster dimensions**3 / 6****How to improve**

- For 5.2 and 5.3, explain why the stationary point is a minimum and give the outer poster dimensions after adding the margins: 9 by 18 inches.

6 Highway patrol related rates**4 / 4****Keep doing**

- For 6, you set up the right-triangle relation and related rates correctly; your approximate speed is compatible with the exact calculation.

7a Limit of a sum**2 / 2**

7b Limit of an integral quotient**2 / 2**

8a Definite trigonometric integral**2 / 2**

8b Definite logarithmic integral**2 / 3****Where it went wrong**

- For 8b, include both endpoint values in the final evaluation; the lower endpoint changes the result to $2 \ln 2 - 3/4$.

9 Indefinite integral**4 / 5****How to improve**

- For 9, the antiderivative is correct; show the substitution and integration steps as well to demonstrate the method required by the criterion.

10 Volume of a cored sphere**5 / 5**

11 Trapezoid rule estimate**4 / 4**

12a Radium decay formula**3 / 4****How to improve**

- For 12a, show the proportional-rate differential equation, solve it, and use the initial amount and half-life to determine the constants.

12b	Radium remaining after 1000 years	1 / 1
------------	--	--------------

13	Arc length of Cornu's spiral	1 / 1
-----------	-------------------------------------	--------------

14a	Find Taylor series	3 / 3
------------	---------------------------	--------------

14b	Radius of convergence	1 / 1
------------	------------------------------	--------------

14c	Approximate $\ln 3/2$	2 / 2
------------	---	--------------

14d	Bound approximation error	2 / 3
------------	----------------------------------	--------------

How to improve

- For 14d, show why the third derivative is bounded by 2 on $[0, 0.5]$ and substitute that into Taylor's inequality to justify the valid 0.0417 bound.
-

15	Bonus inequality proof	0 / 4
-----------	-------------------------------	--------------

How to improve

- For 15, give a proof of both inequalities for every $x > 0$; repeating the claim does not establish it.