

Your version is . Please copy your version into your answer form. Please answer the questions first here (and on the scratch paper). Copy your answers only at the end into the answer form. You will return only the answer form, you will keep this task sheet. Good luck!

Question: Demand and supply are given by $Q_D = 16 - 2P - P^2$ and $Q_S = 2P + P^2$. What is the price in equilibrium? (assume that the price must be positive) (2 points)

1:

a other value	b $1 + \sqrt{7}$	c 2	d $8/3$	e 8
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Question: Be $f = 4x^2 + 9$. What is $f'(3)$? (1 points)

2:

a other value	b $8x$	c 24	d $4x^2$	e 8
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Question: Find the derivative of $\frac{2}{3}x^3 + x^2 + 2x + 7$ (1 points)

- 3a: None of the following is correct.
 3b: $2x^2 + 2x + 2$
 3c: $\frac{2}{3}x^2 + 2x + 2$
 3d: $\frac{3}{x} + 2x + 2$
 3e: $\frac{2}{3}x^2 + x + 2$

Question: Find the derivative of $(x^2 - 2x + 3)^{17}$ (2 points)

- 4a: None of the following is correct.
 4b: $17(x^2 - 2x + 3)^{16}$
 4c: $16(x^2 - 2x + 3)^{17}$
 4d: $16(2x - 2)(x^2 - 2x + 3)^{17}$
 4e: $17(2x - 2)(x^2 - 2x + 3)^{16}$

Question: Find the derivative of $(x^2 + 4)x^{-1}$ (1 points)

5:

a other value	b $\frac{x^2-4}{x^2}$	c $2x$	d $\frac{x^2+4}{x^2}$	e $\frac{x^2+4}{x}$
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Question: Be $y = 4x^5 + 3x^3 + 3x$. What is dx/dy ? (2 points)

- 6a: None of the following is correct.
 6b: $20y^4 + 9y^2 + 3$
 6c: $20x^4 + 9x^2 + 3$
 6d: $1/(20x^4 + 9x^2 + 3)$
 6e: 0

Question: If $f'(x) = \frac{x-1}{x+1}$, what is $f''(x)$? (1 points)

7:

a other value	b $-\frac{x-1}{(x+1)^2}$	c $\frac{2}{x+1}$	d $\frac{2}{(x+1)^2}$	e $\frac{1}{x+1}$
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Question: If $f'(x) = e^{-2x^2+3x+4}$, what is $f''(x)$? (1 points)

- 8a: None of the following is correct.
 8b: $(-2x^2 + 3x + 4)e^{-2x^2+3x+4}$
 8c: e^{-2x^2+3x+4}
 8d: $(-2x^2 + 3x + 4)e^{3-4x}$
 8e: $(3 - 4x)e^{-2x^2+3x+4}$

Question: Be $f(x) = -x^3 + \frac{9}{2}x^2 - 6x + 6$. Where does $f(x)$ have a local maximum? (3 points)

9:

a other value	b 1	c $3/2$	d 2	e $9 - 6x$
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Question: Be $f(x, y) = -y^2 - 2axy + 2x^2$. What is the value of $f_{xy}(3, 1)$? (3 points)

10:

a other value	b $-2a$	c 3	d 4	e $12 - 2a$
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Question: Be $f(x, y) = \frac{x^2-1}{xy}$. What is the value of $f_{xy}(3, 1)$? (2 points)

11:

a other value	b $-\frac{10}{9}$	c $\frac{2}{27}$	d $\frac{10}{9}$	e $-\frac{2}{27}$
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Question: Be $f' = -2x^2 + 10x - 12$. For which value of x does f have a maximum? (2 points)

12:

a other value	b $x = \sqrt{37} - 5$	c $x = 2$	d $x = \frac{5}{2}$	e $x = 3$
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Question: A two-product firm faces the following demand and cost functions: $Q_1 = 24 - 2P_1 - P_2$; $Q_2 = 24 - P_1 - 2P_2$; $C = Q_1^2 + 3Q_2^2 + 10$. Which value of P_2 satisfies the first-order condition to maximise profit? (5 points)

13:

a other value	b 0	c $20/3$	d 8	e 12
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Question: Maximise $x \cdot (y - 4)$ subject to the constraint $x + y = 6$. Which value for x satisfies the first-order condition? (4 points)

14:

a other value	b 1	c 2	d 5	e 0
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Question: Maximise $x + y$ subject to the constraint $x^2 + y^2 = 2$. Which positive value for x satisfies the first-order condition? (5 points)

15:

a other value	b 1	c 2	d 0	e $1/2$
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Question: Find $\int \frac{x-1}{x+1} dx$ (3 points)

- 16a: None of the following is correct.
 16b: $(x^2/2 - x)/(x^2/2 + x) + C$
 16c: $(x^2/2 - x) \ln(x+1) + C$
 16d: $x - \ln(x+1) + C$
 16e: $x - 2 \ln(x+1) + C$

Question: Find $\int_e^3 \frac{x+1}{x-1} dx$ (3 points)

- 17a: None of the following is correct.
 17b: $-2 \ln(e-1) + 2 \ln 2 - e + 3 + C$
 17c: $2 \ln(x-1) + x + C$
 17d: $\frac{x+2}{x-2} + C$
 17e: $5 - \frac{e+2}{e-2} + C$

Question: What is the value of $\int_3^0 f(x) dx$ if $F(x) = -2x + 5$? (2 points)

18:

a other value	b 1	c 5	d 6	e -6
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Question: Be $u > 1$ and $f(x) = \ln(x)$, what is $\frac{d}{du} \int_1^u f(x) dx$? (2 points)

19:

a other value	b $x \ln x - x$	c $u \ln u - u$	d $\ln x$	e $\ln u$
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Question: Find $\int_1^2 e^{2x+1} dx$ (2 points)

20:

a other value	b $\frac{5}{3}(e^5 - e^3)$	c $\frac{9}{2}(e^5 - e^3)$	d $e^5 - e^3$	e $\frac{1}{2}e^{2x+1}$
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total number of points: 47
 obtainable through randomisation: 10
 sufficient to pass: 23