

**ERASMUS UNIVERSITY ROTTERDAM**  
**Entrance examination Mathematics level 3 for Econometrics**

**ANSWERS TO THE SAMPLE QUESTIONS**

Below, only the final answers are given. Note that at the actual entrance exam all necessary steps, graphs and substitutions leading to your final answer must also be reported.

**Question 1**

(a)  $x = \pm\sqrt{5/2}$  or  $x = \pm 2$

(b)  $x = \frac{1 + \ln 3}{3}$

(c)  $x = 1$

**Question 2**

(a)  $3(x^5 - 3x)^2(5x^4 - 3) \sin x + (x^5 - 3x)^3 \cos x$

(b)  $\frac{2 - 3 \sin(3x)}{2x + \cos(3x)}$

(c)  $\frac{(x^2 - 3)(3x^2 \ln x + x^2) - 2x^4 \ln x}{(x^2 - 3)^2}$

**Question 3**

(a)  $-\frac{1}{2} \ln |4 - x^2| + C$

(b)  $2e^2(e^2 - 1)$

(c)  $\frac{9}{8}$

**Question 4**

$x \in [0, \sqrt[3]{4})$

**Question 5**

(a)  $x = 2 \pm \frac{1}{2}\sqrt{2}$

(b)  $p \in (-\infty, 0) \cup (0, \frac{1}{12})$

**Question 6**

$$p = \frac{7}{8}\pi$$

**Question 7**

$$p = 4\sqrt{2} \text{ and } (x, y) = (2, 2\sqrt{2})$$

**Question 8**

$$p = 1 \text{ or } p = g\left(\frac{-5 + \sqrt{33}}{2}\right) = 1 + \frac{1}{2}\log\left(\frac{-5 + \sqrt{33}}{2}\right)$$

**Question 9**

$$\frac{11}{3}$$

**Question 10**

$$\frac{\pi}{6} \left(1 - \frac{1}{e^2}\right)$$