Entrance examination Mathematics level 1
for International Bachelor in Communication and Media

PRACTICE EXAM ANSWERS

Below, only the final answers are given.
Note, that on your examination paper all necessary steps, formulas, substitutions, diagrams
or graphs leading to your final answer must also be written down.
Furthermore, questions containing the words "solve", "derive" or "calculate" require an
exact answer; a decimal approximation is not allowed.

1.	a) $x = -6$ of $x = -4$ b) $x = -12$ of $x = 2$ c) $x = 6$ of $x = 4$
2.	a) $-(5 - 3x)^{-\frac{2}{3}}$ b) $-2x^{-3} + 2x + \frac{1}{2}x^{-\frac{1}{2}} = -\frac{2}{x^3} + 2x + \frac{1}{2\sqrt{x}}$ c) 1
3.	(a) $y = -\frac{1}{3}x + 2$ (b) $y = -\frac{1}{3}x + \frac{4}{3}$ (c) $y = 3x - 2$
4.	(a) mode = median = mean = 6 (b) the mode and the median will not change, the mean will become smaller
5.	a) $x = 4$ en $y = 1$ b) $x = \frac{1}{2}$ en $y = \frac{1}{3}$
6.	a) $\frac{2x+5}{x+2}$ b) $\frac{1}{2}$ c) $\frac{14}{x^2}$

7.	a) impossible, $1, \sqrt{5}, \sqrt{11}, -3, -1, 1, 4$ b) c) $(5, 3)$
8.	(a) (b) $(1, -1)$ $(4, -4)$ $(2, -5)$
9.	(a) equilibrium value $= 0$, amplitude $= 5$, and the period $= 4\pi$ (b) $x = 1, 3, 5$ and 7
10.	Use: $f(x) = \begin{cases} (2x-1)-(x-2) & = x+1 & \text{for } x > 2 \\ (2x-1)+(x-2) & = 3x-3 & \text{for } \frac{1}{2} \le x \le 2 \\ -(2x-1)+(x-2) & = -x-1 & \text{for } x < \frac{1}{2} \end{cases}$
11.	(a) $10\,000(1.004)^{36}$ (b) $K = \dfrac{108056.62}{(1.04)^{15}} = 60\,000$
12.	(a) $x = 125$ (b) $x = -3$ (c) $x = \frac{1}{4^5} = \frac{1}{1024}$
13.	(a) $\left(\frac{1}{6}\right)^6$ (b) $6 \cdot \frac{1}{6} \cdot \left(\frac{5}{6}\right)^5 = \left(\frac{5}{6}\right)^5$ (c) $15 \cdot \left(\frac{1}{6}\right)^4 \left(\frac{5}{6}\right)^2 + 6 \cdot \left(\frac{1}{6}\right)^5 \frac{5}{6} + \left(\frac{1}{6}\right)^6$
14.	(a) $t = \dfrac{\ln 0.5}{\ln 0.9933} = \dfrac{\log 0.5}{\log 0.9933} = {}^{0.9933}\log 0.5$ (b) $\left(1 - \left(\frac{1}{2}\right)^{1/138}\right) \cdot 100\% \approx 0.50\%$ (c) $\left(1 - \left(\frac{1}{2}\right)^{365/138}\right) \cdot 100\% \approx 84.01\%$

15.

(a) $\frac{5}{18} \cdot \frac{4}{17} \cdot \frac{3}{16} \cdot \frac{2}{15} = \frac{1}{612}$

(b) $4! \cdot \frac{3}{18} \cdot \frac{4}{17} \cdot \frac{5}{16} \cdot \frac{6}{15} = \frac{2}{17}$

(c) $6 \cdot \frac{5}{18} \cdot \frac{4}{17} \cdot \frac{6}{16} \cdot \frac{5}{15} = \frac{5}{102}$

(d) $\frac{7}{18} \cdot \frac{6}{17} \cdot \frac{5}{16} \cdot \frac{4}{15} = \frac{7}{612}$