

## IŞIK UNIVERSITY, MATH 103 MIDTERM EXAM-I

Exam Duration: 1 hr. and 15 min.	Q1		Q2		Q3		Row No:
Last Name:	First Name:			Student ID:			

Q.1. (8 pt) Find the domain of the function  $f(x) = \frac{x}{\sqrt{4-3x}}$ .

Q.2. (8 pt) Graph the function  $f(x) = |x - 1| + 2$  by using the graph of  $f(x) = |x|$  and the transformation techniques.

Q.3. (9 pt) For given  $f(x) = \frac{1}{x^2+1}$  and  $g(x) = \sqrt{x+2}$ , find  $(f \circ g)(x)$ ,  $(g \circ f)(x)$  and  $(f+g)(2)$ .



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Exam Duration: 1 hr. and 15 min.	Q4		Q5		Q6		Row No:
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Q4. (8 pt) Graph the functions  $f(x) = 4^x$  and  $g(x) = \log_3 x$ .

Q5. (9 pt) Solve for  $x$ :  $\log_6(x+3) + \log_6(x+4) = 1$

Q6. (8 pt) Find the inverse of  $y = f(x) = 2x + 1$ . Sketch the graph of  $f^{-1}(x)$ .



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Exam Duration: 1 hr. and 15 min.	Q7		Q8		Row No:
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Q7. a) (6 pt) Solve the linear system:

$$\begin{cases} 2x + 3y = 5 \\ 3x - 2y = 2 \end{cases}$$

b) (6 pt) Show that the lines  $2x + 3y = 5$  and  $3x - 2y = 2$  are perpendicular.

Q8. Let the function

$$f(x) = \begin{cases} -x, & -1 \leq x < 0 \\ x^2, & 0 \leq x < 2 \\ 4, & 2 \leq x < 4 \end{cases}$$

be given.

a) (7 pt) Graph the function  $f(x)$ .

b) (6 pt) Evaluate  $f(3)$  and  $f\left(-\frac{1}{2}\right)$ .



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Exam Duration: 1 hr. and 15 min.	Q9		Q10		Q11		Row No:
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**Q9.** (9 pt) For the parabola  $y = -x^2 - 2x + 3$ , find  $x$ -intercepts,  $y$ -intercept and the vertex.

**Q10.** (8 pt) Find the equation of the line passing through the points  $(1, 2)$  and  $(-1, 1)$ .

**Q11.** (8 pt) Solve for  $x$ :  $\log_2(x - 1) = 2$

