Homework:

Multiple-Choice Questions (15 questions)

1. Solve the equation: $2x + 5 = 11$
   A) 3
   B) 4
   C) 5
   D) 6

2. Solve the equation: $x^2 - 5x + 6 = 0$
   A) x=2,3
   B) x=−2,−3
   C) x=1,6
   D) x=−1,−6

3. Solve the equation: $3^x = 27$
   A) 1
   B) 2
   C) 3
   D) 4

4. Solve the equation: $\log_2(x) = 4$
   A) 8
   B) 16
   C) 32
   D) 64

5. Solve the equation: $\sin x = \frac{1}{2}, where 0^\circ \le x \le 180^\circ$
   A) 30°
   B) 150°
   C) $30^\circ, 150^\circ$
   D) $60^\circ, 120^\circ$

6. Solve the inequality: $3x - 7 > 5$
   A) x>4
   B) x<4
   C) x>6
   D) x<6

7. Solve the inequality: $x^2 - 4x - 5 < 0$

A) $-1<x<5$

B) $x<-1$ or $x>5$

C) $x<1$ or $x>5$

D) $1<x<5$

8. Solve the equation: $x^3 - 6x^2 + 11x - 6 = 0$

A) x=1,2,3

B) x=−1,−2,−3

C) x=1,2,−3

D) x=−1,2,3

9. Solve the inequality: $2^{x+1} \geq 8$

A) $x\geq 2$

B) $x\geq 1$

C) $x\leq 2$

D) $x\leq 1$

10. Solve the equation: $\ln(x) = 1$

A) e

B) 1

C) 10

D) 0

11. Solve the inequality: $\cos x \geq \frac{\sqrt{2}}{2}, where 0^0 \leq x \leq 360^0$

$A) 0^\circ \leq x \leq 45^\circ or 315^\circ \leq x \leq 360^\circ$

$B) 45^\circ \leq x \leq 315^\circ$

$C) 0^\circ \leq x \leq 90^\circ$

$D) 90^\circ \leq x \leq 270^\circ$

12. Solve the equation: $|2x - 3| = 7$

A) x=5,−2

B) x=5,2

C) x=−5,2

D) x=−5,−2

13. Solve the inequality: $\log_3(x) < 2$

A) $x<9$

B) $x>9$

C) $0<x<9$

D) $x<0$

14. Solve the equation: $e^x = 5$

$A) x = \ln 5$
$B) x = \log 5$
$C) x = 5$
$D) x = e^5$

15. Solve the inequality: $x^2 + 2x - 3 \le 0$

A) $-3 \le x \le 1$
B) $x \le -3$ or $x \ge 1$
C) $-1 \le x \le 3$
D) $x \le -1$ or $x \ge 3$

Fill-in-the-Blank Questions (5 questions)

1. The solution to the equation $2x - 8 = 0$ is $x =$ _____ .
2. The solution set of the inequality $4x - 3 > 10$ is _____.
3. The solution to the equation $\log_5(x) = 2$ is $x =$ _____ .
4. The solution set of the inequality $x^2 - 9 < 0$ is _____.
5. The solution to the equation $\tan x = 1$ in the interval $[0, \pi]$ is $x =$ _____ .

Short-Answer Questions (5 questions)

1. Solve the equation: $2^{x+1} = 16$, and show your working process.
2. Solve the inequality: $\frac{x-3}{x+2} > 2$, and represent the solution set on a number line.
3. Solve the trigonometric equation: $2\sin x - 1 = 0$ where $0^\circ \le x \le 360^\circ$.
4. Solve the logarithmic equation: $\log(x) + \log(x-3) = 1$.
5. Solve the cubic inequality: $x^3 - 4x^2 + x + 6 \ge 0$, and write the solution set.