وزارة التـــعلـــيم العالـــي
جامعة الملك سعـود
عمادة السنة التحضيرية

King Saud University	Chap.1	Math 130 (PreCalculus)
Preparatory Year Deanship		Benchmarks
Math Skill Department		Time Allowed: 90 Minutes
First Semester		1431/1432

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

Find the domain of the variable in the equation. Write the answer in interval notation.

1) $(1 - y) + 2y = 12 - 4(y - 1)$

2) $\dfrac{4}{x} = 5 + \sqrt{x}$

3) $\dfrac{4x}{(y - 4)(y - 8)} = x + 14$

Solve the equation.

4) $2x - 6 = 0$

5) $-9x + 8 = 5 - 7x$

6) $6(4x - 1) = 24$

7) $3(y + 6) = 4(y - 7)$

8) $(7x + 9) + 5 = 8(x - 9)$

9) $\dfrac{x}{2} = \dfrac{x}{9} + 8$

10) $30 - \dfrac{x}{8} = \dfrac{x}{7}$

Solve the rational equation.

11) $\dfrac{4}{x} - 4 = \dfrac{16}{x}$

Use the definition of equality of complex numbers to find the real numbers x and y such that the equation is true.

12) $2 + xi = y + 5i$

13) $6 + yi = x + \sqrt{-36}$

Perform the operation and write the result in the standard form.

14) $(-7 + 3i) + (10 + 4i)$

15) $(-6 - 5i) + (12 + 3i)$

16) $(12 + 8i) - (3 + 2i)$

17) $(-9 + 16i) - (5 - 3i)$

18) $4i(3 - 6i)$

19) $(5 - 3i)(2 + 6i)$

20) $(5 + \sqrt{-9})(3 + \sqrt{-64})$

21) $(6 - \sqrt{-36})(2 + \sqrt{-121})$

22) $(6 + 4i)^2$

23) $(7 + 5i)(7 - 5i)$

Write the conjugate $\bar{z}$ of the complex number z. Then find $z\bar{z}$.

24) $z = -2 - i$

25) $z = 8 - 3i$

26) $z = \dfrac{3}{4} - \dfrac{1}{2}i$

Write the quotient in the standard form.

27) $\dfrac{5}{-6i}$

28) $\dfrac{3}{6 - i}$

29) $\dfrac{7i}{5 + i}$

30) $\dfrac{4 + 5i}{5 - 4i}$

31) $\dfrac{6 - 3i}{3 + 2i}$

32) $\dfrac{-4 + \sqrt{-64}}{4 - 9i}$

Solve the equation by factoring.

33) $x^2 - 11x + 30 = 0$

34) $x^2 = x + 56$

35) $5x^2 - 14x = 3$

Solve the equation by the square root property.

36) $2x^2 = 50$

37) $4x^2 = 52$

38) $5x^2 + 5 = 185$

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

39) $(x - 2)^2 = 36$ 39) _____
     A) $\{-4, 8\}$ B) $\{38\}$ C) $\{-8, -4\}$ D) $\{-6, 6\}$

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

40) $(7x - 6)^2 = 20$

Solve the equation by completing the square.

41) $x^2 - 10x + 21 = 0$

42) $x^2 + 18x + 70 = 0$

43) $x^2 - 12x - 11 = 0$

44) $5x^2 - 2x - 2 = 0$

Solve the equation using the quadratic formula.

45) $x^2 + 2x - 63 = 0$

46) $x^2 = 9 - 4x$

47) $2x^2 = -8x - 5$

48) $3x(x + 5) = -10$

49) $(2x - 1)(x + 1) = 4$

3

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

50) $8x^2 + 7x = -2$ 50) _____

A) $\left\{ \dfrac{7 + i\sqrt{15}}{16}, \dfrac{7 - i\sqrt{15}}{16} \right\}$

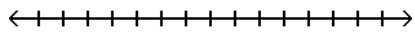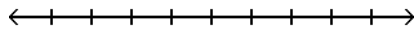B) $\left\{ \dfrac{7 + \sqrt{15}}{16}, \dfrac{7 - \sqrt{15}}{16} \right\}$

C) $\left\{ \dfrac{-7 + i\sqrt{15}}{16}, \dfrac{-7 - i\sqrt{15}}{16} \right\}$

D) $\left\{ \dfrac{-7 + \sqrt{15}}{16}, \dfrac{-7 - \sqrt{15}}{16} \right\}$

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

Graph the solution set of the inequality and write it in interval notation.

51) $-1 < x < 1$

52) $3 \le x \le 7$

53) $3 \le x \le 7$

54) $-2 \le x < 6$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

55) $t \ge -2$

56) $y < -3$
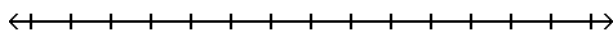
57) $-3x \ge 18$
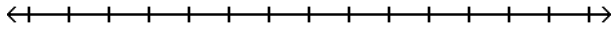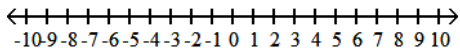
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
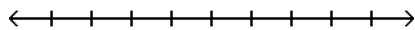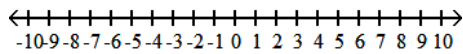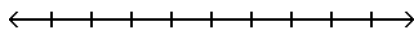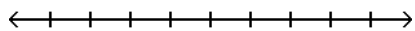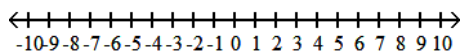
Solve the inequality. Write the solution in interval notation and graph the solution set.

58) $x - 2 < 0$

4

59) x + 4 < 10

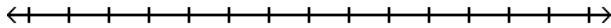60) 4x + 7 < 27
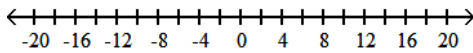

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

61) 3x – 1 ≤ 2x – 2

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

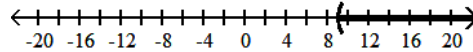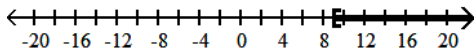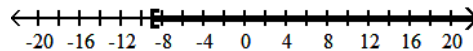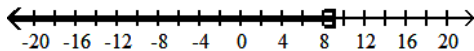62) $\dfrac{x}{3} \geq 2 + \dfrac{x}{9}$

62) _____

-20 -16 -12 -8 -4 0 4 8 12 16 20

A) [9, ∞)

B) (9, ∞)

-20 -16 -12 -8 -4 0 4 8 12 16 20

-20 -16 -12 -8 -4 0 4 8 12 16 20

C) (-∞, 9]

D) [-9, ∞)

-20 -16 -12 -8 -4 0 4 8 12 16 20

-20 -16 -12 -8 -4 0 4 8 12 16 20

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

Solve the inequality.

63) 3x + 12 < -3 or 5 + x > 13

64) $\dfrac{5x - 5}{3} \leq 4$ or $\dfrac{15 - 4x}{3} \geq 5$
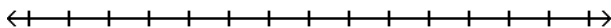
Solve the problem.

65) 1 – 3x ≤ 10 and 5x – 3 ≤ 12
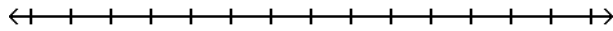
66) 3(x + 1) – 1 ≥ 11 and 5(1 – x) + 28 > 3

67) 6x – 3 > 33 and 5(3x + 4) < 2(10x + 5) – 5(x – 2)

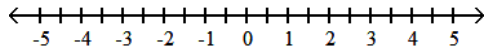Solve the combined inequality and graph the solution set. Write the solution in interval notation.
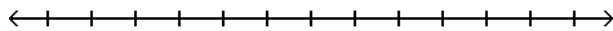
68) 5 ≤ 3x – 4 ≤ 14

69) $-22 \le -3x - 1 < -10$

70) $0 \le \dfrac{3x + 1}{2} < 3$

71) $5x + 2 > 4x + 1 \ge 10x$

Solve the absolute value equation.

72) $\left| -x \right| = 6$

73) $\left| t - 6 \right| = 0$

74) $\left| b + 1 \right| = 7$

75) $3\left| x - 3 \right| = 18$

76) $\left| x \right| + 7 = 9$

77) $\left| 8x + 7 \right| + 4 = -4$

Solve the equation.

78) $\left| x - 9 \right| = \left| 4 - x \right|$

79) $\left| 6x - 3 \right| = \left| x + 8 \right|$

Solve the inequality.

80) $|x| > 3$

81) $\left| 8x \right| \le 2$

82) $\left| x - 5 \right| < 0$

83) $\left| x \right| + 7 > 17$

84) $\left| 17x - 8 \right| < -2$