Math 100 Exam 2 Review Problems

These problems are intended to help you prepare for the test. Test problems will look similar to, but not the same as, some of the problems below.

This list of problems is not all inclusive and does not represent every possible type of problem. It is suggested that you review lectures, classwork problems, and homework problems in addition to this review.

Due on the day of the exam.

(1) Solve the following system of equations:

(a) $x - 3y = 1$
$y = -2x + 2$

(b) $-x + y = 4$
$x - 2y = 6$

(2) Solve the following systems of equations.

(a) $x = 7 - 7y$
$6x - 5y = -5$

(b) $3x + 6y = 18$
$3x + 2y = 26$

(3) Solve the following systems of equations.

(a) $y = 4x - 1$
$3y = 6x + 9$

(b) $6x + 3y = 30$
$2x + 3y = 18$

(4) Perform the indicated operation and simplify your answers.

(a) $(x^2 - 5x + 8) + (2x + 6)$
(b) $(7x^2 + 2x - 5) - (2x^2 - 9x - 1)$
(c) $(4x - 5)(x - 2)$
(d) $(2x + 3)^2$

(5) Simplify the following expressions completely by combining like terms.

(a) $(4x^2 + 9x - 1) - (2x^2 + 10)$
(b) $x^2y - 2xy^2 + 1 + 2x^2y + 3y^2 - 3$
(c) $(x + 2)^2 + x(x - 1)$

(6) Perform the indicated operation and simplify your answers.

(a) $-5x(-3x^2 - x + 1)$
(b) $(2x + 2)(3x + 5)$
(c) $(x + 2)^2$
(d) $(2x^2 - x + 3)(3x^2 - 4x + 1)$

(7) Simplify the following expressions completely by completing the indicated operation and combining like terms.

(a) $2(x^2 - 9x + 14) - (-3x + 6)$
(b) $(3x - 3)(x - 3)$
(c) $(3 - x + x^2)(4 - 7x + 6x^2)$

(8) Divide the following polynomials:

(a) $(x^3 + 2x^2 - 11x + 5) \div (x + 4)$
(b) $(5x^3 - 4x^2 - 7x + 5) \div (x - 2)$
(c) $(8x^2 + 6x - 9) \div (2x + 1)$
(d) $(3x^3 + x^2 + 2x + 5) \div (x^2 + 2x + 1)$

(9) Divide the following polynomials:

(a) $(2x^2 - 7x + 9) \div (2x + 3)$
(b) $(12x^6 - 15x^2y + 21) \div (3x^2)$
(c) $(3x^4 - 12x^3 - 60x + 1) \div (x - 5)$
(d) $(2x^2 - 7x^2 + 4x - 5) \div (x - 3)$

(10) Factor the following polynomials completely.

(a) $x^2 - 10x + 16$
(b) $3x^2 - 9x - 30$
(c) $2x^2 - 5x - 3$
(d) $x^3 - 3x^2 + 2x - 6$

(11) Use a special factoring formula to factor the following.

(a) $x^2 - 25$
(b) $x^3 + 8$
(c) $x^3 - 1$
(d) $x^2 - 16$

(12) Factor the following:

(a) $16y^8 + 6y^3$
(b) $-25x^4y^3 - 45x^2y^4 + 35xy^5$
(c) $6x^2 - 3x - 4x + 2$
(d) $6xy - 2x + 3y^2 - y$

(13) Factor the following polynomials completely.

(a) $x^2 + 5x + 6$
(b) $x^2 - 15x + 54$
(c) $4x^2 + 8x - 12$

(14) Factor the following polynomials completely.

(a) $4x^2 + 4x - 15$
(b) $9x^2 - 6x + 1$
(c) $8x^3 + 12x^2 - 8x$

(15) Solve the following equations.

(a) $(x - 3)(3x - 1) = 0$
(b) $x^2 - 5x - 6 = 0$
(c) $-2x + 8 = 3x - 7$
(d) $-5x^2 - 14x = -x^3$

(16) Solve the following equations.

(a) $x^2 + 11x + 30 = 0$
(b) $(x - 2)(2x + 1) = 0$
(c) $-2x + 8 = 3x - 7$
(d) $x^2 = 8x - 7$

(17) Solve the following polynomial equations.

(a) $x^2 - 4x - 12 = 0$

(b) $2x^3 + 6x^2 - 20x = 0$

(c) $x^2 + 2x + 6 = -3x + 2$

(18) (a) Simplify $\dfrac{x^3 - 8}{x^2 - 4}$

(b) Simplify $\dfrac{x^2 + 9x + 20}{2x^2 + 5x - 12}$

(c) Find the domain of $f(x) = \dfrac{2x + 13}{x^3 - 25x}$ in interval notation

(d) Find the domain of $\dfrac{x + 9}{x - 2}$ in interval notation

(19) Perform the given operations on the given rational expressions.

(a) $\dfrac{x - 6}{3x + 15} \cdot \dfrac{4x + 20}{4x - 24}$

(b) $\dfrac{4}{x - 4} + \dfrac{5}{x + 7}$

(20) Perform the given operations on the given rational expressions.

(a) $\dfrac{2x^2 + x - 1}{x^2 - 1} \cdot \dfrac{x + 1}{2x - 1}$

(b) $\dfrac{x^2 + 4x + 3}{x + 1} \div \dfrac{x + 3}{x}$

(c) $\dfrac{1}{x^2 - 36} - \dfrac{4x + 3}{x^2 + 13x + 42}$

(d) $\dfrac{7}{9x^2y} + \dfrac{17}{3xy^3}$