Practice 16A Final Exam

Name_____

The Exit Exam will be 20 multiple–choice questions. You must get 14 correct to pass the course. These problems are similar in format and difficulty to those on the exam. The answers are given on the last page.

MULTIPLE CHOICE. Write the letter of the answer in the blank provided. If your instructor provides an optical answer sheet, record your answers there as well. There is one answer per question. You may use your calculator. Good luck.

Perform the indicated operation.

1) $[(1.3x^3 + 7.3x^2 + 4.2) + (6.6x – 2.1)] – (3.2x^2 –x – 9.4)$ 1) _____

   A) $1.3x^3 + 4.1x^2 + 7.6x + 11.5$ B) $13x^6 + 11.5$

   C) $1.3x^3 + 4.1x^2 + 6.6x + 11.5$ D) $1.3x^3 + 10.5x^2 + 5.6x – 7.3$

2) $(8x – 1)(x^2 – 6x + 1)$ 2) _____

   A) $8x^3 – 48x^2 + 8x + 1$ B) $8x^3 – 47x^2 + 2x – 1$

   C) $8x^3 – 49x^2 + 14x – 1$ D) $8x^3 + 49x^2 – 14x + 1$

Factor out the GCF from the polynomial.

3) $54x^8y^9 + 18x^6y^6 + 24x^3y^4$ 3) _____

   A) $6(9x^8y^9 + 3x^6y^6 + 4x^3y^4)$ B) $6x^3y^4(9x^5y^5 + 3x^3y^2 + 4)$

   C) $6x^3(9x^5y^9 + 3x^3y^6 + 4y^4)$ D) no common factor

Factor the four–term polynomial by grouping.

4) $xy + 12x – 3y – 36$ 4) _____

   A) $(y – 12)(x + 3)$ B) $(y + 12)(x – 3)$ C) $(x + 12)(y – 3)$ D) $(x – 12)(y + 3)$
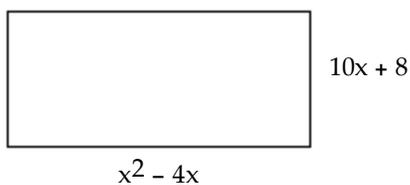
5) $xy + y + 8x + 8$ 5) _____

   A) $(x + 8)(y + 1)$ B) $(x + 1)(y + 8)$ C) $(8x + 8)(y + 1)$ D) $(x + 1)(8y + 8)$

Factor the trinomial completely. If the polynomial cannot be factored, write "prime."

6) $x^2 – 5x – 24$ 6) _____

   A) prime   B) $(x – 8)(x + 3)$ C) $(x – 24)(x + 1)$ D) $(x + 8)(x – 3)$

Write the perimeter of the rectangle as a simplified polynomial. Then factor this polynomial completely.

7)   7) _____

10x + 8

x² – 4x

   A) $(2x + 2)(x + 4)$ B) $(x + 2)(x + 4)$ C) $2(x – 4)(x + 10)$ D) $2(x + 2)(x + 4)$

Factor the trinomial completely. If the polynomial cannot be factored, write "prime."

8) $3x^3 + 9x^2y – 30xy^2$ 8) _____

   A) $(x – 2y)(3x^2 + 15xy)$ B) prime

   C) $3x(x + 2y)(x – 5y)$ D) $3x(x – 2y)(x + 5y)$

Factor completely.

9) $6x^2y^2 - 23xy^2 + 20y^2$

    A) $(3x - 4y)(2x - 5y)$ B) $y^2(x - 4)(6x - 5)$

    C) $y^2(3x - 4)(2x - 5)$ D) $(2x - 4y)(3x - 5y)$

9) _____

Factor the perfect square trinomial completely.

10) $z^2 - 2z + 1$

    A) $(z - 2)(z + 2)$ B) $(z + 1)^2$ C) $(z - 1)^2$ D) $(z - 1)(z + 1)$

10) _____

11) $x^3 + 16x^2 + 64x$

    A) $x(x + 8)^2$ B) $x(x + 8)(x - 8)$ C) $x(x - 8)^2$ D) prime

11) _____

Factor the trinomial by grouping.

12) $6z^2 + 5z - 6$

    A) prime   B) $(2z + 3)(3z - 2)$ C) $(6z + 3)(z - 2)$ D) $(2z - 3)(3z + 2)$

12) _____

13) $15z^2 + 11z - 12$

    A) $(3z + 4)(5z - 3)$ B) prime   C) $(15z + 4)(z - 3)$ D) $(3z - 4)(5z + 3)$

13) _____

Factor the binomial completely.

14) $9x^2 - 4$

    A) $(3x - 2)^2$ B) $(3x + 2)(3x - 2)$ C) prime   D) $(3x + 2)^2$

14) _____

15) $x^4 - 1$

    A) $(x^2 + 1)(x + 1)(x - 1)$ B) prime

    C) $(x^2 - 1)(x^2 - 1)$ D) $(x^2 + 1)(x^2 + 1)$

15) _____

Solve the equation.

16) $x(3x + 16) = 12$

    A) $\frac{2}{3}, -6$ B) $0, \frac{16}{3}$ C) $\frac{3}{2}, 6$ D) $0, -\frac{16}{3}$

16) _____

17) $x^2 - 4 = 3x$

    A) $1, -4$ B) $-1, 4$ C) $-2, 2$ D) $-2, -2$

17) _____

18) $3x^3 - 4x^2 - 7x = 0$

    A) $\frac{3}{7}, -1, 0$ B) $\frac{7}{3}, -1, 0$ C) $\frac{3}{7}, 1$ D) $\frac{3}{7}, 0$

18) _____

Find the x-intercepts of the graph of each equation.

19) $y = (6x - 4)(x + 1)$

    A) $\left(\frac{3}{2}, 0\right), (1, 0)$ B) $\left(\frac{3}{2}, 0\right), (-1, 0)$ C) $\left(\frac{3}{2}, 0\right), (0, 0)$ D) $\left(\frac{2}{3}, 0\right), (-1, 0)$

19) _____

20) $y = 4x^2 + 4x$

    A) $(0, 0)$ B) $(-1, 0), (4, 0)$ C) $(-1, 0)$ D) $(-1, 0), (0, 0)$
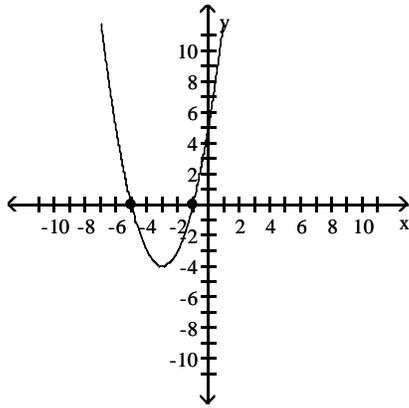
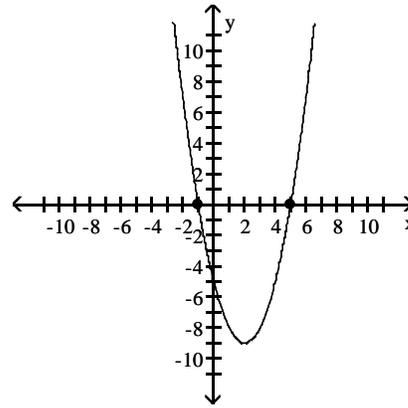20) _____

Match the equation with its graph.

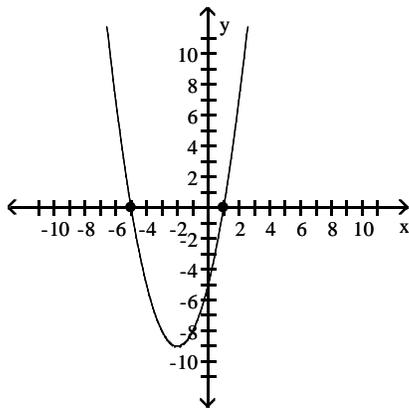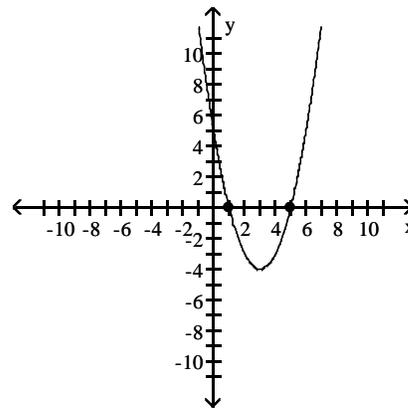21) $y = (x - 1)(x + 5)$ 21) _____

A)

B)

C)

D)

Solve.

22) The width of a rectangle is 6 kilometers less than twice its length. If its area is 80 square   22) _____
kilometers, find the dimensions of the rectangle.

    A) length = 5 km, width = 4 km   B) length = 8 km, width = 10 km

    C) width = 8 km, length = 10 km   D) length = 3 km, width = $\dfrac{80}{3}$ km

23) An object is thrown upward from the top of a 160–foot building with an initial velocity of 48 feet   23) _____
per second. The height h of the object after t seconds is given by the quadratic equation
$h = -16t^2 + 48t + 160$. When will the object hit the ground?

    A) –2 sec   B) 2 sec   C) 160 sec   D) 5 sec

Find the domain of the rational expression.

24) $f(x) = \dfrac{x^2 - 30x}{5x}$ 24) _____

    A) $\left\{ x \mid x \text{ is a real number and } x \neq \dfrac{1}{5} \right\}$

    B) $\{ x \mid x \text{ is a real number and } x \neq 5 \}$

    C) $\{ x \mid x \text{ is a real number and } x \neq 0 \}$

    D) $\{ x \mid x \text{ is a real number and } x \neq 0 \text{ and } x \neq 30 \}$

25) $f(x) = \dfrac{x}{4x - 3}$ 25) _____

    A) $\left\{x \mid x \text{ is a real number and } x \neq -\dfrac{3}{4}\right\}$ B) $\left\{x \mid x \text{ is a real number and } x \neq \dfrac{4}{3}, x \neq 0\right\}$

    C) $\left\{x \mid x \text{ is a real number and } x \neq -\dfrac{4}{3}, x \neq 0\right\}$ D) $\left\{x \mid x \text{ is a real number and } x \neq \dfrac{3}{4}\right\}$

Simplify the rational expression.

26) $\dfrac{14 - 2x}{35 - 5x}$ 26) _____

    A) –7   B) 7   C) $-\dfrac{2}{5}$ D) $\dfrac{2}{5}$

27) $\dfrac{3x + 3}{15x^2 + 24x + 9}$ 27) _____

    A) $\dfrac{1}{5x + 3}$ B) $\dfrac{3x + 3}{15x^2 + 24x + 9}$ C) $\dfrac{3x}{5x + 3}$ D) $\dfrac{3x + 5}{5x + 24}$

28) $\dfrac{x^2 + 11x + 30}{x^2 + 12x + 36}$ 28) _____

    A) $-\dfrac{x^2 + 11x + 30}{x^2 + 12x + 36}$ B) $\dfrac{x + 5}{x + 6}$ C) $\dfrac{11x + 5}{12x + 6}$ D) $\dfrac{11x + 30}{12x + 36}$

Solve the problem.

29) If $f(x) = \dfrac{x - 10}{5x + 8}$, find $f(-2)$.   29) _____

    A) 0   B) 6   C) 1   D) –6

30) If $f(x) = \dfrac{x^3 - 7}{x^2 + 5}$, find $f(-4)$.   30) _____

    A) $-\dfrac{64}{21}$ B) $\dfrac{3}{7}$ C) $-\dfrac{71}{21}$ D) $-\dfrac{71}{16}$

31) A drug is injected into a patient and the concentration of the drug is monitored. The drug's   31) _____
concentration, $C(t)$, in milligrams after t hours is modeled by $C(t) = \dfrac{8t}{3t^2 + 2}$. Estimate the drug's
concentration after 3 hours. (Round to the nearest hundredth.)
    A) 0.83 mg   B) 2.18 mg   C) 2.03 mg   D) 0.68 mg

Find the product and simplify.

32) $\dfrac{z^3}{8z} \cdot \dfrac{4}{3z^2}$ 32) _____

    A) $\dfrac{z}{6}$ B) $\dfrac{1}{6}$ C) $\dfrac{z^3}{6z^2}$ D) $\dfrac{1}{6z}$

33) $\dfrac{x^2 + 10x + 21}{x^2 + 15x + 56} \cdot \dfrac{x^2 + 16x + 64}{x^2 + 11x + 24}$

    A) $\dfrac{1}{x + 8}$ B) $\dfrac{x + 8}{x + 8}$ C) 1   D) $\dfrac{x + 3}{x + 8}$

33) _____

Find the quotient and simplify.

34) $\dfrac{4y^3}{z^5} \div \dfrac{8y^3z^5}{9}$

    A) $\dfrac{32y^6}{9}$ B) $\dfrac{9y^6}{2z^{10}}$ C) $\dfrac{9}{2}$ D) $\dfrac{9}{2z^{10}}$

34) _____

35) $\dfrac{x^2 - 6x + 9}{2x - 6} \div \dfrac{5x - 15}{10}$

    A) 10   B) $\dfrac{x^2 - 6x + 9}{(x - 3)^2}$ C) 1   D) $\dfrac{(x - 3)^2}{4}$

35) _____

Perform the indicated operation. Simplify if possible.

36) $\dfrac{x}{x^2 + 7x - 44} - \dfrac{4}{x^2 + 7x - 44}$

    A) $x - 4$ B) $x + 11$ C) $\dfrac{1}{2(x + 11)}$ D) $\dfrac{1}{x + 11}$

36) _____

37) $\dfrac{2}{5x} + \dfrac{7}{10x}$

    A) $\dfrac{3}{5x}$ B) $\dfrac{11}{10x}$ C) $\dfrac{8}{5x}$ D) $\dfrac{11}{10x^2}$

37) _____

38) $\dfrac{x - 2}{x^2 + 9x + 20} + \dfrac{3x + 7}{x^2 + 5x + 4}$

    A) $\dfrac{4x^2 + 21x + 33}{(x - 4)(x - 5)(x - 1)}$ B) $\dfrac{4x^2 + 21x + 33}{(x + 4)(x + 5)(x + 1)}$

    C) $\dfrac{4x + 5}{2x^2 + 14x + 24}$ D) $4x + 5$

38) _____

Solve the equation.

39) $\dfrac{5 - a}{a} + \dfrac{3}{4} = \dfrac{7}{a}$

    A) 8   B) –8   C) –4   D) 4

39) _____

40) $\dfrac{2}{t} = \dfrac{t}{5t - 12}$

    A) 4, 6   B) $0, \dfrac{24}{9}$ C) 0, 36   D) 0

40) _____

Solve the equation for the indicated variable.

41) $I = \dfrac{nE}{nr + R}$ for r

    A) $r = \dfrac{-R}{In - E}$ B) $r = \dfrac{nE - IR}{In}$ C) $r = \dfrac{IR}{In + E}$ D) $r = IR(In - E)$

41) _____

Solve.

42) On an architect's blueprint, 1 inch corresponds to 9 feet. Find the length of a wall represented by a line $2\dfrac{1}{3}$ inches long on the blueprint. Round to the nearest tenth if necessary.

    A) 25.9 ft   B) 38.6 ft   C) 3.3 ft   D) 21 ft

42) _____

43) Five divided by the difference of a number and 6 equals the quotient of 10 and the sum of the number and 8. Find the number.

    A) $\dfrac{20}{3}$ B) $\dfrac{14}{5}$ C) -4 D) 20

43) _____

VOCABULARY. You should know the following vocabulary.

44)

Exponents and Polynomials Chapter: polynomial, binomial, trinomial, monomial, distributive property, dividend, quotient, divisor

Factoring Polynomials Chapter: factored form, factors, terms, GCF (greatest common factor), integers, sum, difference, perfect square trinomial, quadratic equation, Pythagorean Theorem, hypotenuse and leg of right triangle

Rational Expressions Chapter: undefined, domain, reciprocal, denominator, LCD (least common denominator), proportion

1) A
2) C
3) B
4) B
5) B
6) B
7) D
8) D
9) C
10) C
11) A
12) B
13) A
14) B
15) A
16) A
17) B
18) B
19) D
20) D
21) C
22) B
23) D
24) C
25) D
26) D
27) A
28) B
29) B
30) C
31) A
32) B
33) C
34) D
35) C
36) D
37) B
38) B
39) B
40) A
41) B
42) D
43) D
44)