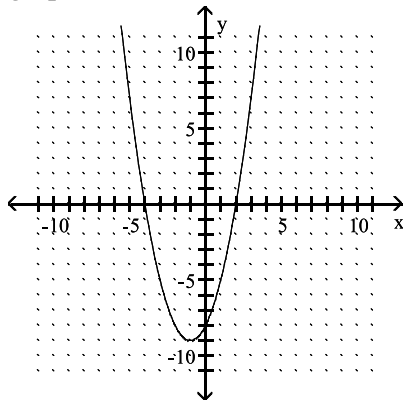


The items on this review are representative of the items that you might see on your course final exam. No formula sheets are allowed and calculators are not allowed on the MATH 0312 final exam. You should not use formulas or a calculator when working through the items on this review.

- 1) Find the **SUM** of the solutions of the equation. $4x^2 + 20x = 56$

- 2) Use the Quadratic Formula to solve the equation. $4n^2 = -6n - 1$

- 3) Choose the function that matches the graph.



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

- 4) Use the square root property to solve the equation. $(x - 6)^2 = 16$

- 5) Find the **SUM** of the solutions of the quadratic equation. $5x^2 + 3x - 2 = 0$

- 6) Find the product. $(4x - 5y)^2$

- 7) Find the product. $(9p - 1)(81p^2 + 9p + 1)$

- 8) Find the product. $(2r - 3)(2r + 3)$

- 9) Factor by grouping. $x^3 + 6x^2 + 8x + 48$

- 10) Factor by grouping. $m^2s - m^2t - as + at$

- 11) Divide. $x + 8 \overline{)x^2 + 11x + 17}$

- 12) Perform the long division to find the remainder.

$$5x + 4 \overline{)-15x^3 - 32x^2 + 4x + 16}$$

- 13) Simplify the complex fraction.

$$\frac{4 + \frac{2}{x}}{\frac{x}{3} + \frac{1}{6}}$$

- 14) Give the domain of $f(x) = \frac{2x + 22}{x^2 - 9}$.

- 15) Give the domain of $f(x) = \sqrt{x - 3}$.

- 16) Factor: $-x^2 - 2x + 24$

- 17) Determine the two factors of $20z^2 - 7z - 6$.

- 18) Factor: $x^3 - 216$

- 19) A room has an area of 456 square feet. One dimension is 5 feet more than the other. Find the dimensions of the room.

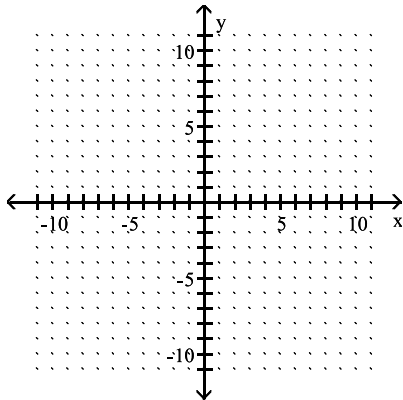
20) The perimeter of a rectangle is 44 m. If the width were doubled and the length were increased by 8 m, the perimeter would be 76 m. What is the length of the rectangle?

21) Name the quadrant, if any, in which the point is located. $(-14, 2)$

22) Find the slope of the line through the given pair of points, if possible. Based on the slope, indicate whether the line through the points rises from left to right, falls from left to right, is horizontal, or is vertical.
 $(-7, -9)$ and $(-5, -8)$

23) Find the slope and the y-intercept of $4x - 5y = 5$.

24) Graph the line through $(0, 6)$, with a slope $= \frac{1}{2}$.



25) Simplify. $\frac{y^2 + 5y + 6}{y^2 + 8y + 12}$

26) Solve for x.
 $-9x + 6(2x - 3) = -11 - 4x$

27) Solve $-5x + 4y = 3$ for y.

28) Simplify. $\frac{a^2 - 2a}{a^3 - 8}$

29) Simplify the complex fraction. $\frac{4 + \frac{2}{x}}{\frac{x}{4} + \frac{1}{8}}$

30) Solve the system for x: $5x - 2y = -1$
 and $x + 4y = 35$

31) Solve the system for y: $2x - 3y = -2$
 and $6x - 9y = 6$

32) Give the solution set: $|12 - 4p| = 8$

33) Give the solution set: $|y + 3| - 5 = 11$

34) Find $f(-3)$ when $f(x) = 4x^2 - 4x + 6$.

35) Find $g(a - 1)$ when $g(x) = 3x - 3$.

36) Solve for p: $\frac{p}{4} - \frac{3p}{8} = 4$

37) Solve for x: $1 - \frac{3}{2x} = \frac{7}{4}$

38) Simplify: $\left(\frac{1}{4}\right)^{-4}$

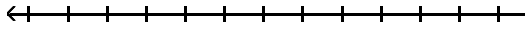
39) Simplify: $(-3x^9)(-2x^{-4})$

40) Simplify: $\left(-\frac{27}{125}\right)^{-2/3}$

41) Multiply. $(7 - 5i)(7 + 9i)$ Give the answer in standard form.

42) Simplify. $\frac{3+3i}{5+2i}$ Give the answer in standard form.

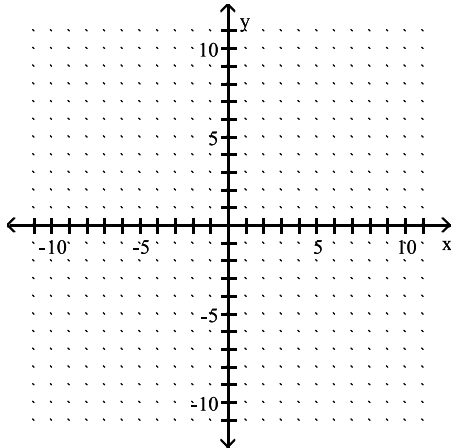
43) Solve for y. $-7y - 12 \leq -8y - 5$
Graph the solution set.



44) Simplify. $\sqrt{3} + 3\sqrt{108} + 2\sqrt{75}$

45) Simplify. Assume that all variables represent positive real numbers.
 $6\sqrt{32x^2} - 2\sqrt{18x^2} - \sqrt{2x^2}$

46) Find the x- and y-intercepts. Then graph the equation. $3x - 18y = 18$



47) Perform the indicated operation and express in lowest terms.

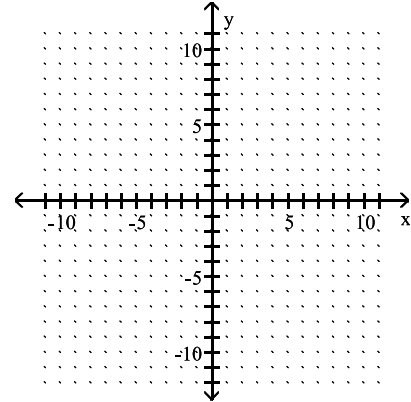
$$\frac{3x+10}{x^2-2x-8} - \frac{x+6}{x^2-2x-8}$$

48) Perform the indicated operation and express in lowest terms.

$$\frac{3}{10x} + \frac{9}{14x^2}$$

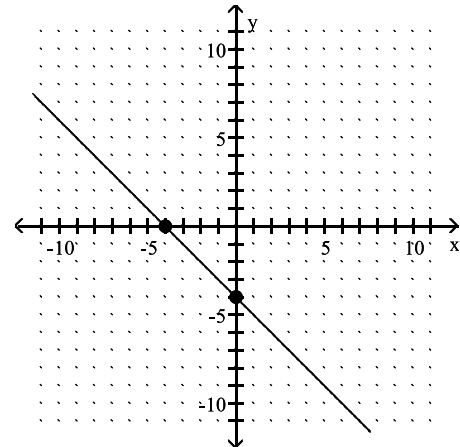
49) Graph the linear inequality.

$$2x + 4y \leq 8$$



50) For $f(x) = 3x^2 - 5x - 4$, the parabola opens _____.

51) Find the slope of the line.



52) Write the solution set in interval notation:

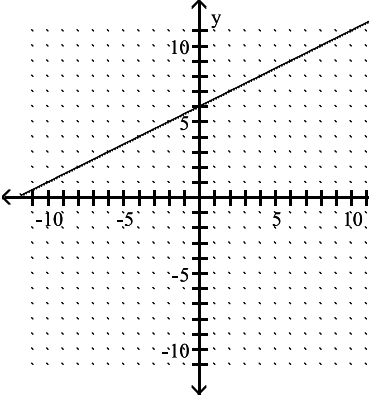
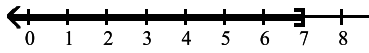
$$-7 < x$$

53) Rationalize the denominator. $\frac{5}{\sqrt{7}}$

54) Factor. $81x^2 - 126xy + 49y^2$

Answer Key

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- 1) -5
(5.5 Solve Quadratic Equation by Factoring)
- 2) $\left\{ \frac{-3 \pm \sqrt{5}}{4} \right\}$
(8.2 Use Quadratic Formula to Solve Equation (Real Solutions))
- 3) C
- 4) {2, 10}
(8.1 Use Square Root Property to Solve Equation)
- 5) $-\frac{3}{5}$
(8.1 Solve Equation by Completing the Square - Real Solution)
- 6) $16x^2 - 40xy + 25y^2$
(4.4 Square a Binomial)
- 7) $729p^3 - 1$
(4.4 Multiply Polynomials)
- 8) $4r^2 - 9$
(4.4 Multiply Conjugate Binomials)
- 9) $(x + 6)(x^2 + 8)$
(5.1 Factor by Grouping)
- 10) $(s - t)(m^2 - a)$
(5.1 Factor by Grouping)
- 11) $x + 3 - \frac{7}{x + 8}$
(4.5 Divide Polynomial by Binomial)
- 12) remainder = 0
(4.5 Divide Polynomial by Binomial)
- 13) $\frac{12}{x}$
(6.3 Simplify Complex Fraction)
- 14) $\{x \mid x \neq -3, 3\}$
(6.1 Give the Domain of a Rational Function)
- 15) $[3, \infty)$
(7.1 Give Domain of a Radical Function)
- 16) $-(x - 4)(x + 6)$
(5.2 Factor Trinomial with Lead Coefficient not 1 or -1)
- 17) $(4z - 3)$ and $(5z + 2)$
(5.2 Factor Trinomial with Lead Coefficient not 1 or -1)
- 18) $(x - 6)(x^2 + 6x + 36)$
(5.3 Factor Sum/Difference of Cubes)
- 19) 19 feet, 24 feet
(5.5 Solve Apps by Factoring)
- 20) 14 m
(3.3 Solve Geometric Apps)
- 21) II (2.1 Name Quadrant in which point is located)
- 22) $\frac{1}{2}$; rises
(2.2 Find slope given two points and state nature of slope)
- 23) Slope $\frac{4}{5}$; y-intercept (0, -1)
(2.3 Find Slope and y-Intercept given equation)
- 24) 
(2.2 graph line given point and slope)
- 25) $\frac{y + 3}{y + 6}$
(6.1 Write Rational Expression in lowest terms)
- 26) {1}
(1.1 Solve Linear Equation in One Variable)
- 27) $y = \frac{3 + 5x}{4}$
(1.2 Solve Equation for y)
- 28) $\frac{a}{a^2 + 2a + 4}$
(6.1 Simplify Rational Expression)
- 29) $\frac{16}{x}$
(6.3 Simplify Complex Fraction)
- 30) 3
(3.1 Solve System of Linear Equations)
- 31) No solution
(3.1 Solve System of Linear Equations)
- 32) {1, 5}
(1.7 Solve Absolute Value Equation)
- 33) {13, -19}
- 34) 54
(2.6 Evaluate Function)
- 35) $3a - 6$
(2.6 Evaluate Function)
- 36) {-32}
(1.1 Solve Linear Equation with Fractions)
- 37) {-2}
(6.4 Solve Rational Equation)
- 38) 256
(4.1 Simplify Using Power, Product, and Quotient Rules)
- 39) $6x^5$
(4.1 Simplify Using Power, Product, and Quotient Rules)
- 40) $\frac{25}{9}$
(7.2 Simplify Expression Involving Rational Exponents II)
- 41) $94 + 28i$
(7.7 Multiply Complex Numbers)
- 42) $\frac{21}{29} + \frac{9}{29}i$
(7.7 Divide Complex Numbers)
- 43) 
(1.5 Solve Inequality)

Answer Key

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44) $29\sqrt{3}$

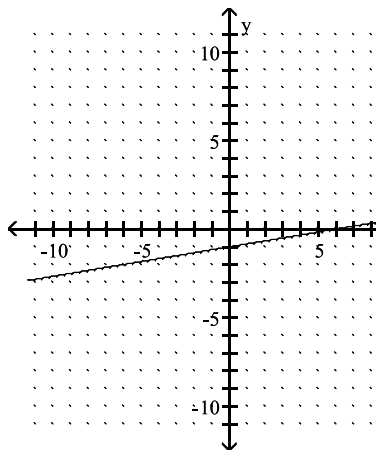
(7.4 Simplify Sum/Difference of Radicals - Index = 2)

45) $17x\sqrt{2}$

(7.4 Simplify Sum/Difference of Radicals - Index = 2)

46) $(6, 0); (0, -1)$

(2.1 Find Intercepts and Graph Equation)



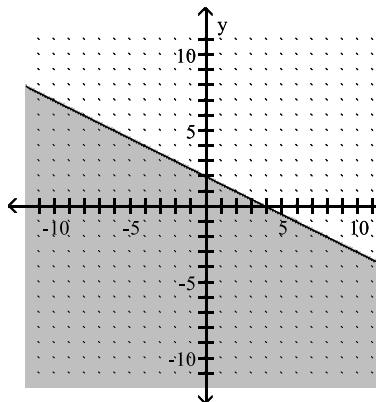
47) $\frac{2}{x-4}$

(6.2 Add/Subtract Rational Expressions - Common Denominator)

48) $\frac{3(7x+15)}{70x^2}$

(6.2 Add/Subtract Rational Expressions I)

49)



(2.4 Graph Linear Inequality)

50) up

(8.5 Predict Direction of Parabola from Equation)

51) -1

(2.2 Find Slope of Line Given Graph)

52) $(-7, \infty)$

(1.5 Write Interval Notation)

53) $\frac{5\sqrt{7}}{7}$

(7.5 Rationalize Denominator - Index = 2)

54) $(9x - 7y)^2$

(5.3 Factor Perfect Square Trinomial)