

Houston Community College System

Department of Developmental Mathematics

Math 0314 – Intermediate Algebra

Final Exam Review

This Review is comprehensive but should not be the only material used to study for the Final Exam. It should not be considered a preview of the Final Exam. Studying your previous tests, quizzes, homework, class notes, text discussions, etc. will prepare you to do well on the Final Exam. There may be questions on the Final Exam that are unlike questions on this Review, and vice versa. No question on this Review will be duplicated exactly on the Final Exam. This Review is much longer than the Final Exam.

You may obtain help working on this Review in the Tutoring Center at any HCC campuses.

Solve the equation.

1) $2m + 6 + 4(3m - 5) = 5(m + 5)$ 1) _____

2) $\frac{-3x + 4}{5} + \frac{6}{5} = -\frac{3x}{4}$ 2) _____

3) $\frac{y}{6} - 6 = 5$ 3) _____

4) $-0.04x + 0.11(x + 22,000) = 2560$ 4) _____

Solve the mixture problem.

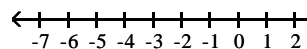
5) How many liters of a 20% alcohol solution must be mixed with 40 liters of a 50% solution to get a 30% solution? 5) _____

Solve the investment problem.

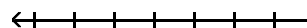
6) Mardi received an inheritance of \$70,000. She invested part at 11% and deposited the remainder in tax-free bonds at 10%. Her total annual income from the investments was \$7400. Find the amount invested at 11%. 6) _____

Solve the inequality. Give the solution set in both interval and graph forms.

7) $-2 < -2a \leq 6$ 7) _____



8) $-6x + 11 > -7x + 15$ 8) _____

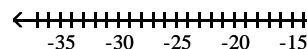


Solve the equation.

9) $|b + 8| = 8$ 9) _____

Solve the inequality and graph the solution set.

10) $|8 - x| \leq 8$ 10) _____



Solve the equation.

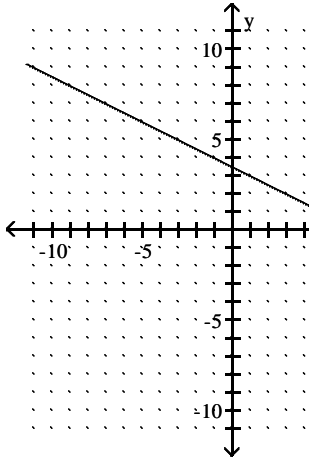
11) $\left|1 + \frac{1}{8}x\right| = 2$ 11) _____

Name the quadrant, if any, in which the point is located.

12) $(-9, 7)$ 12) _____

Find the slope of the line.

13)



13) _____

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.

14) $(-3, -9)$ and $(-1, 6)$ 14) _____

Find the slope and the y-intercept of the line.

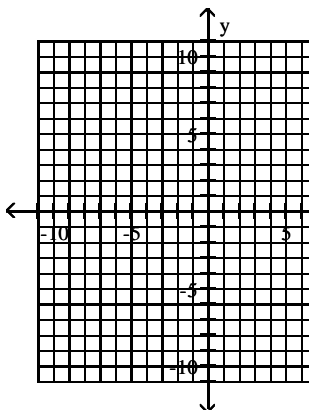
15) $4x + 3y = 29$ 15) _____

Write the equation in slope-intercept form.

16) $-4x + 8y = 8$ 16) _____

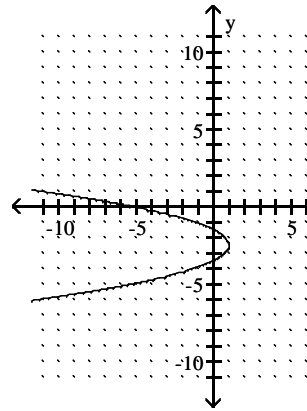
Graph the linear equation.

17) $2x - y = -2$ 17) _____



Decide whether the relation is a function, and give the domain and range.

18)



18) _____

An equation that defines y as a function of x is given. Solve for y in terms of x , and replace y with the function notation $f(x)$.

19) $5x - 6y = 5$ 19) _____

Solve the problem.

20) Find $f(3)$ when $f(x) = 5x^2 + 4x + 7$. 20) _____

Decide whether the ordered pair is a solution of the given system.

21) $x + y = -6$
 $x - y = 4$; $(-1, -5)$ 21) _____

Solve the system by substitution. If the system is inconsistent or has dependent equations, say so.

22) $x + y = 1$
 $y = 2x - 5$ 22) _____

Apply the product rule for exponents, if possible.

23) $(-3x^5y)(-4x^9y^2)$ 23) _____

Simplify the expression. Write your answer with only positive exponents. Assume that all variables represent nonzero real numbers.

24) $\left(\frac{-2w^7}{x}\right)^4$ 24) _____

25) $(x^7)^{-3}$ 25) _____

Express the number in scientific notation.

26) 719,283 26) _____

Express the number in standard notation.

27) 4.14×10^{-4} 27) _____

Solve the system to find the value of x

28) $x + y = -8$
 $x - y = -2$ 28) _____

Find the product.

29) $(6p - 1)(36p^2 + 6p + 1)$ 29) _____

Divide.

30) $\frac{30x^6 + 48x^5 + 36x^4}{6x^5}$ 30) _____

31) $\frac{x^2 + 5x - 24}{x + 8}$ 31) _____

Factor the polynomial completely.

32) $x^2 - x - 42$ 32) _____

Perform the indicated operation and express in lowest terms.

33) $\frac{2p - 2}{p} \cdot \frac{7p^2}{4p - 4}$ 33) _____

Express the rational expression in lowest terms.

34) $\frac{y^2 - 5y - 36}{y^2 - 4y - 45}$ 34) _____

Which of the following is a Factor

35) $12x^2 - 10x + 30x - 25$ 35) _____

Add or subtract as indicated. Write the answer in lowest terms.

36) $\frac{4}{r} + \frac{5}{r - 3}$ 36) _____

Perform the indicated operation and express in lowest terms.

37) $\frac{m^2 - 5m}{m - 2} + \frac{6}{m - 2}$ 37) _____

Simplify the complex fraction.

38) $\frac{9 + \frac{3}{x}}{\frac{x}{4} + \frac{1}{12}}$ 38) _____

Simplify the expression involving rational exponents.

39) $(-64)^{1/3}$ 39) _____

Find the distance between the pair of points.

40) (7, 2) and (-6, -5) 40) _____

Express the radical in simplified form. Assume that all variables represent positive real numbers.

41) $\sqrt[3]{27k^9}$ 41) _____

42) $\sqrt[4]{16a^4}$ 42) _____

Multiply using the product rule.

43) $\sqrt{10} \cdot \sqrt{7}$ 43) _____

Multiply or divide as indicated.

44) $\sqrt{-3} \cdot \sqrt{-3}$ 44) _____

Multiply.

45) $2i(5 - 2i)$ 45) _____

Add or subtract as indicated. Write your answer in the form $a + bi$.

46) $[(3 + 8i) - (4 + 7i)] - (5 - 3i)$ 46) _____

Multiply and Write the expression in the form $a + bi$.

47) $\frac{-10}{-1 + 6i}$ 47) _____

Use the zero-factor property to solve the equation.

48) $x^2 - 3x - 18 = 0$ 48) _____

Use the square root property to solve the equation.

49) $(p - 5)^2 = 15$ 49) _____

Use the quadratic formula to solve the equation.

50) $x^2 = 7 - 4x$ 50) _____

Use the quadratic formula to solve the equation.

51) $8x^2 + 7x = -2$ 51) _____

Find the vertex of the parabola.

52) $f(x) = 2x^2 + 16x + 33$ 52) _____

53) $f(x) = 3x^2 - 12x + 16$ 53) _____

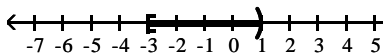
Decide whether the graph of the equation opens up, down, to the left, or to the right; and whether it is wider, narrower, or the same shape as the graph of $f(x) = x^2$ (or $x = y^2$).

54) $f(x) = -5x^2 + 9x + 9$ 54) _____

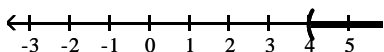
Answer Key

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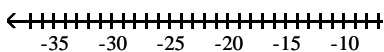
- 1) $\left\{\frac{13}{3}\right\}$
- 2) $\left\{-\frac{40}{3}\right\}$
- 3) {66}
- 4) {2000}
- 5) 80 liters
- 6) \$40,000
- 7) [-3, 1)



- 8) (4, ∞)



- 9) {0, -16}
- 10) [0, 16]



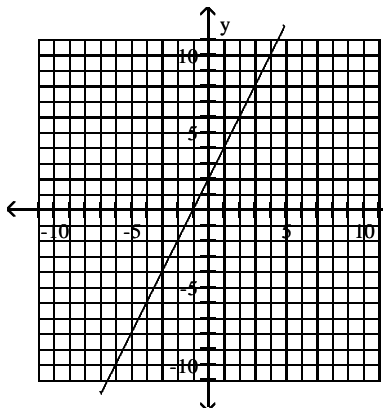
- 11) {-24, 8}
- 12) II
- 13) $-\frac{1}{2}$

- 14) $\frac{15}{2}$; rises

- 15) Slope $-\frac{4}{3}$; y-intercept $\left(0, \frac{29}{3}\right)$

- 16) $y = \frac{1}{2}x + 1$

- 17)



- 18) Not a function; domain: $(-\infty, 1]$; range: $(-\infty, \infty)$

- 19) $f(x) = \frac{5 - 5x}{-6}$

- 20) 64

- 21) Yes
- 22) $\{(2, -1)\}$
- 23) $12x^{14}y^3$
- 24) $\frac{16w^{28}}{x^4}$
- 25) $\frac{1}{x^{21}}$
- 26) 7.19283×10^5
- 27) 0.000414
- 28) 2
- 29) $216p^3 - 1$
- 30) $5x + 8 + \frac{6}{x}$
- 31) $x - 3$
- 32) $(x + 6)(x - 7)$
- 33) $\frac{7p}{2}$
- 34) $\frac{y + 4}{y + 5}$
- 35) $(2x + 5)$
- 36) $\frac{9r - 12}{r(r - 3)}$
- 37) $m - 3$
- 38) $\frac{36}{x}$
- 39) -4
- 40) $\sqrt{218}$
- 41) $3k^3$
- 42) 2a
- 43) $\sqrt{70}$
- 44) -3
- 45) $4 + 10i$
- 46) $-6 + 4i$
- 47) $\frac{10}{37} + \frac{60}{37}i$
- 48) $\{-3, 6\}$
- 49) $\{5 + \sqrt{15}, 5 - \sqrt{15}\}$
- 50) $\{-2 + \sqrt{11}, -2 - \sqrt{11}\}$
- 51) $\left\{\frac{-7 + i\sqrt{15}}{16}, \frac{-7 - i\sqrt{15}}{16}\right\}$
- 52) (-4, 1)
- 53) (2, 4)
- 54) Opens down