HOUSTON COMMUNITY COLLEGE

# Final Exam Review
## Math 0309 - Introductory Algebra

**INSTRUCTIONS:** This set of problems is meant to help you practice the kind of material that may appear on your final exam and does not represent exactly what your final will look like. There may be questions on your final that are unike questions on this review and vice versa. No question on the review will be duplicated exactly on the final. Your final will consist of 33 multiple choice questions, so you should bring a scantron with you on the day of your final exam.

**FINAL EXAM CALCULATOR POLICY**: You are allowed to use a basic calculator during the final exam. You are NOT allowed to use a scientific or graphing calculator.  Any calculator that is used must be a nonprogrammable calculator that is not capable of accessing the internet or interfacing with any other device, has a single line display, and has math operation keys that do not exceed addition, subtraction, multiplication, division, square root, percent, and negation (plus/minus). Using a smartphone as a calculator is strictly forbidden.

**Name the set using the roster method.**
    1) The set of whole numbers 2 through 5

**Find the intersection.**
    2) {b, c, d, e, f} $\cap$ {g, h, i, j, k}

**Find the union.**
    3) {3, 5, 7, 13} $\cup$ {0, 3, 8, 13}

    4) **Find**  C' $\cup$ A'

      **Let  U = {q, r, s, t, u, v, w, x, y, z}**
         **A = {q, s, u, w, y}**
         **B = {q, s, y, z}**
         **C = {v, w, x, y, z}.**

**Convert the symbolic compound statement into words.**
    5) p represents the statement "It's raining in Chicago."
    q represents the statement "It's windy in Boston."
    Translate the following compound statement into words:

        p $\lor$ q

**Let p represent a true statement and let q represent a false statement. Find the truth value of the given compound statement.**
    6) p $\lor$ ~q

**Construct a truth table for the statement.**
    7) (t $\land$ s) $\lor$ (~t $\land$ ~s)

8) Use the order of operations to simplify the expression.

$$\frac{-10 \cdot 3 + 36}{(36 - 34)^2}$$

**Simplify.**

9) $[5(x - 4) - 7] + [9(x - 1) + 9]$

10) $\sqrt{400}$

**Evaluate the expression for the given value of x.**

11) $-4x^3, \ x = -1$

**Divide.**

12) $\frac{1}{3} \div \left(-\frac{1}{9}\right)$

**Solve the equation .**

13) $-8 + s = 11$

**Solve the equation.**

14) $9x + 3 = 57$

**Solve.**

15) $\frac{4}{5} + 4y = 5y - \frac{3}{20}$

**Solve.**

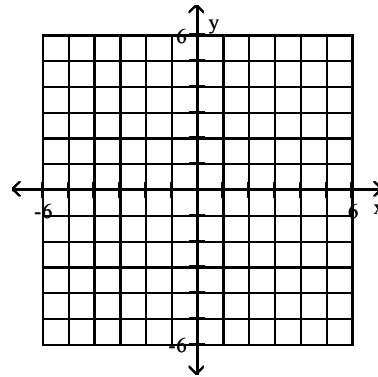16) $5(8x - 20) = 4(25x - 10)$

17) $V = \frac{1}{3}Bh \quad$ for h

**Graph the linear equation.**

18) $-x + 5y = 2$

**Plot the ordered pairs on the rectangular coordinate system provided.**
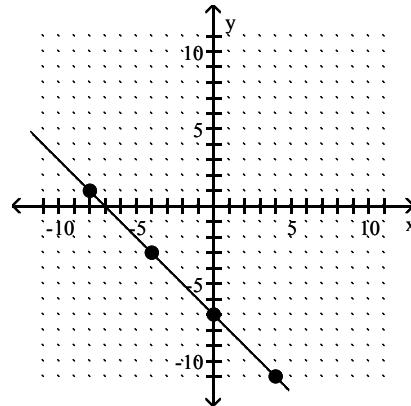
19) A(3, -2), B(-5, 5)



**Find the slope of the line going through the pair of points.**

20) (-1, -8), (6, -8)

21) (3, -4), (3, -1)

**Find the slope of the line.**

22)



23) The graph of a quadratic model is in the shape of what letter? What is the formal name of the graph of a quadratic model?

**Divide and simplify.**

24) $\frac{(12x)^{17}}{(12x)^{17}}$

25) $\frac{t^4}{t^6}$

**Simplify.**

26) $\left(\dfrac{a^4}{b^5}\right)^3$

27) Simplify.

$-36y^0$

**Simplify.**

28) $\left(\dfrac{a^3}{b^4}\right)^4$

**Evaluate the polynomial.**

29) $8x^2 + 6x + 3$, when $x = -2$

**Collect like terms.**

30) $10a^9 - 12a^9 + 10a^7 + 9a^9 - 3a^7$

31) $9a^8 - 8a^8 + 14a^7 + 13a^8 - 13a^7$

**Add.**

32) $(3 + 5x^5 + 3x^3) + (9x^5 + 7x^3 + 3)$

**Subtract.**

33) $(2x + 7x^6 + 16x^5) - (14x^5 + 4x^6 - 7x)$

**Multiply.**

34) $9x(-2x - 6)$

35) $(2x - 4)(x + 11)$

36) $(11p + 1)(11p - 1)$

37) Multiply the expressions.

$(4y^7)(-2y^6)$

**Multiply.**

38) $(-6y + 1)(-8y^2 - y - 9)$

**Divide.**

39) $\dfrac{70x^5 + 56x^2 - 21x}{7x}$

**Factor.**

40) $5x(4x + 3) + 2(4x + 3)$

**Factor by grouping.**

41) $x^3 + 6x^2 - 10x - 60$

**Factor.**

42) $x^2 - x - 42$

43) $8m^8 - 6m^6 - 12m^2$

**Solve the problem. Round to the nearest hundredth, if necessary.**

44) 15 is 3% of what number?

**Solve the problem. Round to the nearest tenth of a percent.**

45) 4.4 is what percent of 16.5?

**Solve the problem.**

46) A sweater costs $42.66. If the sales tax rate is 4.5%, how much tax is charged?

47) A telephone costs $159. If the sales tax rate is 6%, how much tax is charged and what is the total price? Round your answers to the nearest cent.

48) The sales tax rate in one state is 4.5%. How much tax will be charged on a purchase of 8 chairs at $51 apiece? Round your answer to the nearest cent.

49) The price of a necklace is $6.99. If the salesperson's rate of commission is 13%, how much commission is earned on the sale of the necklace? Round to the nearest cent.

50) Sales of frozen pizza for a club fund-raiser increased from 500 one year to 690 the next year. What was the percent of increase?

51) Bicycles are often on sale in September. The regular price of one bicycle is $102.95. With a 15% discount, what is the sale price of the bicycle? Round to the nearest cent.

52) By switching service providers, a family's telephone bill decreased from about $50 a month to about $44. What was the percent of decrease?

**Find the simple interest. Round your answer to the nearest cent.**

53) Principal = $2800
   Interest Rate = 12.3%
   Time in years $= \dfrac{1}{3}$

**Find the compound amount for the deposit. Round to the nearest cent.**

54) $16,000 at 8% compounded annually for 7 years

**Solve the problem.**

55) The following is a list of heights, in inches, of six people:

| Susan | 67 |
| Umar | 75 |
| Mark | 74 |
| Dorota | 67 |
| Mike | 76 |
| Gina | 66 |

What is the median height?

**Find the mean.**

56) 27, 34, 16, 30, 13, 34, 14

**Solve the problem.**

57) The following prices per pound of ocean perch were found at seven supermarkets:
   $6.59, $7.49, $7.39, $7.59, $6.59, $7.29, $6.39
   What is the mode?

58) For the 8 test scores shown, find the percentile rank of 67.

   18   63   67   11   94   1   52   6

**Use the pictograph to answer the question.**

59) This pictograph shows projected sales of compact disks (CDs) for a popular rock band for seven consecutive years.

| Year | Projected CD Sales |
| --- | --- |
| 2013 | ☉☉ |
| 2012 | ☉☉☉☉ ☉☉ |
| 2011 | ☉☉☉☉ ☉☉☉☉☉ |
| 2010 | ☉☉☉☉ ☉☉☉☉☉☉ |
| 2009 | ☉☉☉☉☉ |
| 2008 | ☉☉☉☉ ☉☉☉ |
| 2007 | ☉☉☉ |

   ☉ = 10,000 CDs

In which year will the greatest number of CDs be sold?

**The bar graph below shows the number of students by major in the College of Arts and Sciences. Answer the question.**
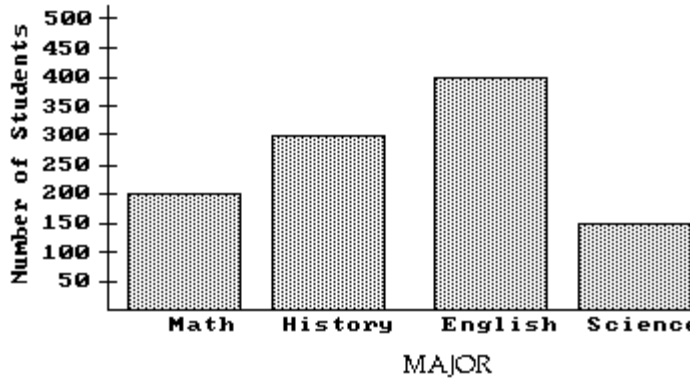


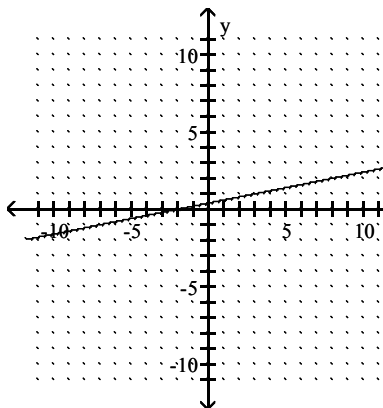60) How many more students are majoring in math than in science?

1) {2, 3, 4, 5}

2) ∅

3) {0, 3, 5, 7, 8, 13}

4) {q, r, s, t, u, v, x, z}

5) It's raining in Chicago or it's windy in Boston.

6) True

7)

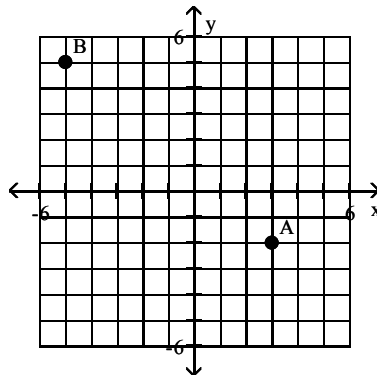| t | s | (t ∧ s) ∨ (~t ∧ ~s) |
|---|---|---|
| T | T | T |
| T | F | F |
| F | T | F |
| F | F | T |

8) $\dfrac{3}{2}$

9) 14x - 27

10) -20

11) 4

12) -3

13) 19

14) 6

15) $\dfrac{19}{20}$

16) -1

17) $h = \dfrac{3V}{B}$

18)



19)



20) 0

21) Undefined

22) -1

23) U; parabola

24) 1

25) $\dfrac{1}{t^2}$

26) $\dfrac{a^{12}}{b^{15}}$

27) -36

28) $\dfrac{a^{12}}{b^{16}}$

29) 23

30) $7a^9 + 7a^7$

31) $14a^8 + 1a^7$

32) $14x^5 + 10x^3 + 6$

33) $3x^6 + 2x^5 + 9x$

34) $-18x^2 - 54x$

35) $2x^2 + 18x - 44$

36) $121 p^2 - 1$

37) $-8y^{13}$

38) $48y^3 - 2y^2 + 53y - 9$

39) $10x^4 + 8x - 3$

40) $(5x + 2)(4x + 3)$

41) $(x + 6)(x^2 - 10)$

42) $(x + 6)(x - 7)$

43) $2m^2(4m^6 - 3m^4 - 6)$

44) 500

45) 26.7%

46) $1.92

47) $9.54, $168.54

48) $18.36

49) $0.91

50) 38%

51) $87.51

52) 12%

53) $114.80

54) $27,421.19

55) 70.5 inches

56) 24

57) $6.59

58) 75th percentile

59) 2010

60) 50