



**ST. BRENDAN**  
**HIGH SCHOOL**



**College Statistics**  
**Summer Math Packet**

*Congratulations! You will soon be learning Statistics soon!*

This summer math packet is a review of some of the concepts learned in your Algebra classes that are needed when you begin your Statistics course in August. It will assure that all students begin the school year on the same page and with equal opportunity to learn and build upon mathematical concepts that should have been learned in previous courses.

**Instructions for completing the packet:**

- Please print the packet or use loose leaf paper to complete the packet by hand showing all work. Work must be neat and legible.
- Please use your Pre-Calculus notes or the websites provided to help you if you need reminders on how to complete some practice problems.
- Take notes as you complete your work. You will be given a quiz on this material the first week of school.
- Work on the packet with your friends. Help each other. Every student is responsible for knowing the material in this packet when you return in August. We will review as a team and everyone will be expected to participate.
- Bring your packet to our first class together. It will be collected for a grade. Only packets done with paper and pencil will be accepted.

**Helpful Websites:**

<http://www.mathstv.com/>

<http://www.purplemath.com/modules/index.htm>

<https://www.khanacademy.org>

**Helpful for graphing functions:**

<https://www.education.ti.com/en/resources/family-of-functions>

Name \_\_\_\_\_

**SHORT ANSWER.** Write the word or phrase that best completes each statement or answers the question.

**Solve the equation.**

1)  $39t - 36 = 4t - 6$

1) \_\_\_\_\_

**Solve the equation for y.**

2)  $7x + 2y = 5$

2) \_\_\_\_\_

3)  $-4x + 7y = 8$

3) \_\_\_\_\_

**Solve the problem.**

4) Thompson's Hardware spent \$49,170 this year on utility costs alone. If total sales were \$ 258,800, what percent of total sales was spent on utility costs? Round to the nearest tenth of a percent, if necessary.

4) \_\_\_\_\_

Let  $A = \{q, s, u, v, w, x, y, z\}$ ,  $B = \{q, s, y, z\}$ ,  $C = \{v, w, x, y, z\}$ , and  $D = \{s\}$ . Specify the following set.

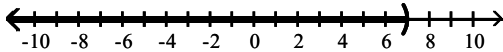
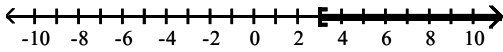
5)  $A \cap B$

5) \_\_\_\_\_

**Graph the union or intersection of the two sets, as requested.**

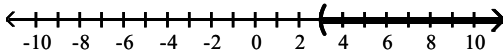
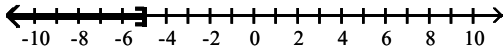
6) Intersection

6) \_\_\_\_\_



7) Union

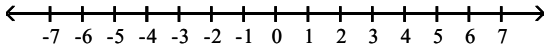
7) \_\_\_\_\_



**For the compound inequality, give the solution set in both interval and graph forms.**

8)  $6x - 8 \geq -38$  and  $6x - 8 \leq -14$

8) \_\_\_\_\_



**Solve the equation.**

9)  $\left| 7 - \frac{1}{3}x \right| = 9$

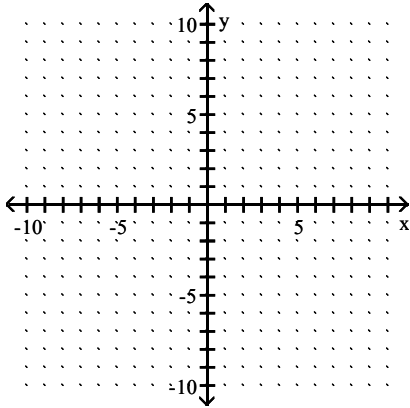
9) \_\_\_\_\_

Solve the given equation or inequality. If an equation is given, then write the solution set in set notation. If an inequality is given, then write the solution set in interval notation.

10)  $\left| \frac{1}{2}x + \frac{1}{5} \right| + \frac{1}{4} = \frac{7}{4}$  10) \_\_\_\_\_

Find the x- and y-intercepts, and graph the equation.

11)  $2x - 4y = -8$  11) \_\_\_\_\_



Solve the problem.

12) In 1980, there were 138,000 farms in a state. As of 2005, there were 78,000. Find the average rate of change in the number of farms per year. 12) \_\_\_\_\_

Find an equation of the line, and write it in (a) slope-intercept form if possible and (b) standard form.

13) Through  $(-2, -4)$  and  $(-9, 4)$  13) \_\_\_\_\_

Solve the problem.

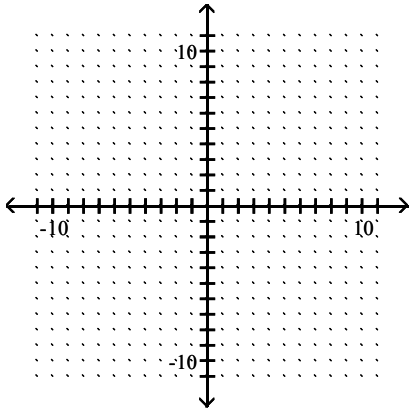
14) The information in the chart gives the salary of a person for the stated years. Use the information for the years 2001 and 2003 to find an equation that models the data. Let  $x = 1$  represent 2001,  $x = 3$  represent 2003, and  $y$  represent the salary. Write the equation in slope-intercept form. Use this equation to approximate the salary for 2004 to the nearest dollar 14) \_\_\_\_\_

Year	Salary
2000	\$23,500
2001	\$24,100
2002	\$25,200
2003	\$26,100
2004	\$27,200

Graph the inequality or compound inequality.

15)  $2x + 3y > -5$

15) \_\_\_\_\_



Give the domain and range of the relation shown in the following.

16)  $\{(4, 4), (-6, 5), (7, 10)\}$

16) \_\_\_\_\_

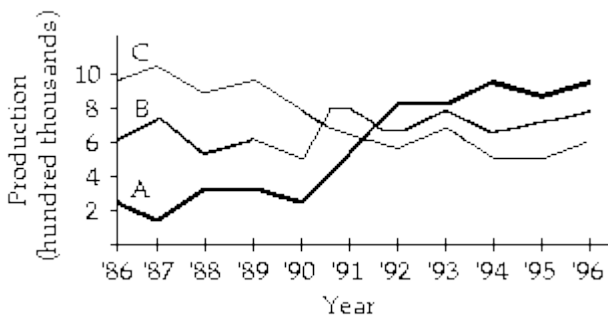
Solve the problem.

17) Find  $f(2)$  when  $f(x) = -x^2 - 4x - 3$ .

17) \_\_\_\_\_

**MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question. You must show all work on Showbie or through a picture from your composition book. If you just circle the answer, you will get no credit.

18) A company manufactures three products. The graph shows the production from 1986 to 1996. Which 18) \_\_\_\_\_ the companies experience production growth over the period shown in the graph?



- A) Company B and Company C
- C) Company A

- B) Company A and Company C
- D) Company A and Company B

**SHORT ANSWER.** Write the word or phrase that best completes each statement or answers the question.

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

19)  $x - 2y = -7$   
 $7x - 3y = 17$

19) \_\_\_\_\_

Solve the problem using a system of equations.

20) Anne and Nancy use a metal alloy that is 18.4% copper to make jewelry. How many ounces of a 17% alloy must be mixed with a 19% alloy to form 110 ounces of the desired alloy?

20) \_\_\_\_\_

Evaluate the expression.

21)  $-5^0$

21) \_\_\_\_\_

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

22)  $\frac{(2x^2y^5)^{-1}}{(3x^2y^3)^3}$

22) \_\_\_\_\_

For the polynomial function, find the requested value.

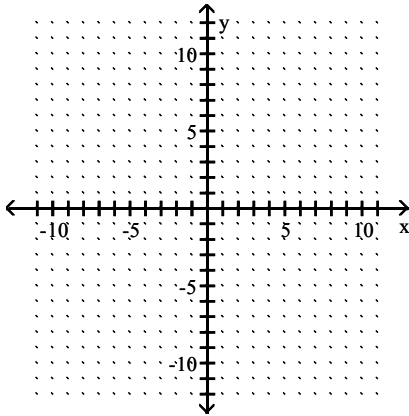
23)  $f(x) = 4x + 6$ ;  $f(8)$

23) \_\_\_\_\_

Graph the function.

24)  $f(x) = -x^3 + 4$

24) \_\_\_\_\_



Perform the indicated operations.

25)  $(4x - 10)(x - 1)$

25) \_\_\_\_\_

For the given pair of functions, find the requested function.

26) If  $f(x) = 18x^3 - 15x^2 - 57x - 2$  and  $g(x) = 6x + 9$ , find  $\left(\frac{f}{g}\right)(4)$ .

26) \_\_\_\_\_

Factor.

27)  $8z^2 - 16z$

27) \_\_\_\_\_

28)  $6x^2 - 7x - 24$

28) \_\_\_\_\_

Solve the equation.

29)  $3x^2 + 17x = -20$

29) \_\_\_\_\_

Solve the problem.

30) A ball is projected upward from ground level. After  $t$  seconds, its height in feet is a function defined by  $f(t) = -16t^2 + 64t$ . After how many seconds will it reach a height of 48 ft?

30) \_\_\_\_\_

**Multiply or divide.**

31)  $\frac{x-6}{(x+4)^2} \cdot \frac{x^2-2x-24}{(x-6)^2}$  31) \_\_\_\_\_

**Simplify the complex fraction.**

32)  $\frac{\frac{12x+21}{7}}{\frac{16x+28}{4}}$  32) \_\_\_\_\_

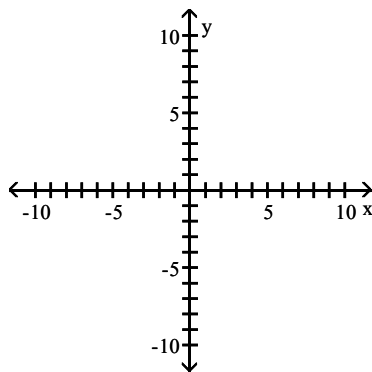
33)  $\frac{a^{-2} - b^{-1}}{7a^{-1} + 3b^{-2}}$  33) \_\_\_\_\_

**Solve.**

34) Sandi can make a quilt in 9 days and Eva can make a quilt in 6 days. In how many days can they make a quilt working together? 34) \_\_\_\_\_

**Graph the function and give its domain and its range.**

35)  $f(x) = \sqrt{x+2}$  35) \_\_\_\_\_



**Simplify the expression. Assume that all variables represent positive real numbers.**

36)  $\frac{5^{3/4}x^{-2/5}y^{3/2}}{5^{-5/4}x^{13/5}y^{1/4}}$  36) \_\_\_\_\_

37)  $\sqrt[3]{x^2} \cdot \sqrt[3]{x^{12}}$  37) \_\_\_\_\_

**Simplify. Assume that all variables represent positive real numbers.**

38)  $(5 - 2\sqrt{5})^2$  38) \_\_\_\_\_

39)  $\frac{-50}{\sqrt{13} + \sqrt{3}}$  39) \_\_\_\_\_

**Perform the indicated operation. Give answer in standard form.**

40)  $(-3 + 4i) - (6 + 5i) - 14i$  40) \_\_\_\_\_

**Solve by using the quadratic formula.**

41)  $4m^2 + 10m + 2 = 0$

41) \_\_\_\_\_

**Solve by any method.**

42)  $1 - \frac{7}{x} - \frac{60}{x^2} = 0$

42) \_\_\_\_\_

**Solve the problem.**

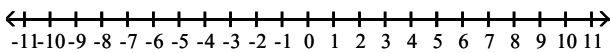
43) Solve  $S = \frac{1}{2} \pi r^2 + (r + 5)h$  for  $r$ .

43) \_\_\_\_\_

**Solve, and graph the solution set.**

44)  $4x^2 + 17x \leq 15$

44) \_\_\_\_\_



**Solve the equation. Give the exact solution.**

45)  $2^x = \frac{1}{16}$

45) \_\_\_\_\_

**Use properties of logarithms to write each expression as a single logarithm. Assume that variables represent positive real numbers, with base  $\neq 1$ .**

46)  $3 \log_b q - \log_b r$

46) \_\_\_\_\_

**Solve the problem.**

47) The growth in the population of a certain rodent at a dump site can be modeled by the exponential function  $A(t) = 141e^{0.027t}$ , where  $t$  is the number of years since 1972. Estimate the population in the year 2000.

47) \_\_\_\_\_

**Write in logarithmic form.**

48)  $10^{-5} = 0.00001$

48) \_\_\_\_\_

**Write in exponential form.**

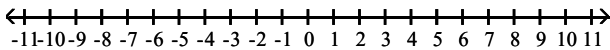
49)  $\log_4 64 = 3$

49) \_\_\_\_\_

**Solve, and graph the solution set.**

50)  $\frac{8}{p-3} < 1$

50) \_\_\_\_\_



**Solve the problem.**

51) Ron can mow the lawn in two hours more time than Paul. Working together they can mow the lawn in 4 hours. How long does it take each of them working alone? Round your answers to the nearest tenth of an hour, if necessary.

51) \_\_\_\_\_



52) A rectangular garden has dimensions of 19 feet by 15 feet. A gravel path of equal width is to be built around the garden. How wide can the path be if there is enough gravel for 552 square feet? 52) \_\_\_\_\_

**Perform the indicated operation. Give answer in standard form.**

53)  $(6 + 8i)(9 + 7i)$  53) \_\_\_\_\_

**Simplify. Assume that all variables represent positive real numbers.**

54)  $\frac{-3}{\sqrt{15}}$  54) \_\_\_\_\_

**Multiply or divide.**

55)  $\frac{x^2 - 64}{x^2 - 14x + 49} \div \frac{7x - 56}{x^2 - 3x - 28}$  55) \_\_\_\_\_

**Perform the indicated operations.**

56)  $\frac{10x^3 + 10x^2 - 35x + 4}{5x}$  56) \_\_\_\_\_

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

57)  $\left(\frac{9x^2}{y^2}\right)^3 \left(\frac{15x^2}{y^{-4}}\right)^{-2}$  57) \_\_\_\_\_

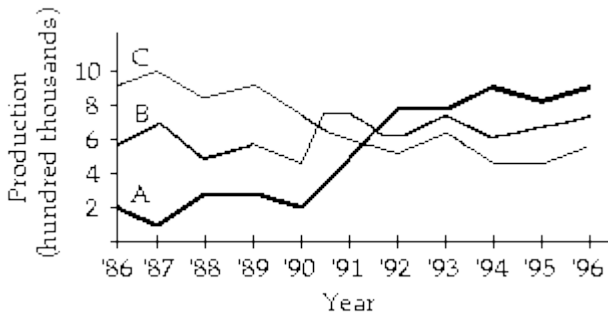
**Evaluate the expression.**

58)  $(-5)^0$  58) \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. You must show all work on Showbie or through a picture from your composition book. If you just circle the answer, you will get no credit.**

**Solve the problem.**

59) A company manufactures three products. The graph shows the production from 1986 to 1996. During which year did the production of C equal the production of A? 59) \_\_\_\_\_



- A) 1996                      B) 1991                      C) 650,000                      D) 600,000

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

Let  $A = \{q, s, u, v, w, x, y, z\}$ ,  $B = \{q, s, y, z\}$ ,  $C = \{v, w, x, y, z\}$ , and  $D = \{s\}$ . Specify the following set. 60)  $B \cup C$  \_\_\_\_\_

Solve the equation.

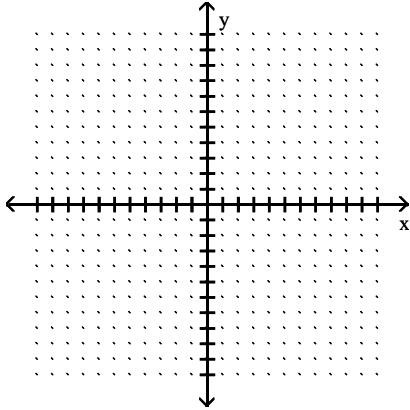
61)  $-[8x + (2x + 9)] = 8 - (5x + 4)$

61) \_\_\_\_\_

Find the center and radius of the circle whose equation is given. Graph the circle.

62)  $(x + 5)^2 + (y + 1)^2 = 9$

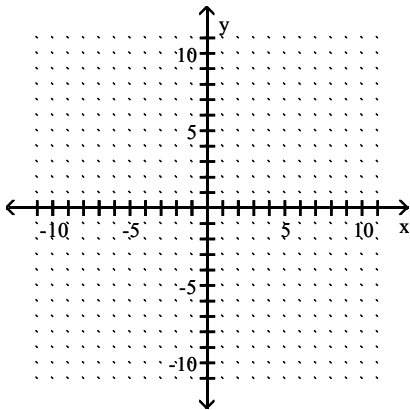
62) \_\_\_\_\_



Graph.

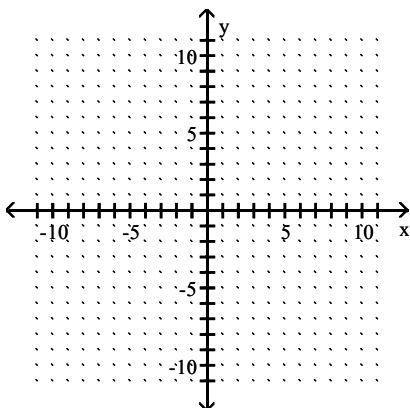
63)  $f(x) = -\sqrt{36 - x^2}$

63) \_\_\_\_\_



64)  $25x^2 + 49y^2 = 1225$

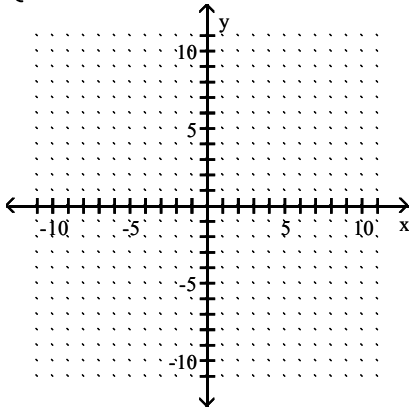
64) \_\_\_\_\_



Graph the inequality.

$$65) \begin{cases} x^2 + y^2 \leq 16 \\ \frac{x^2}{9} + \frac{y^2}{49} \geq 1 \end{cases}$$

65) \_\_\_\_\_



Write the first five terms of the sequence described.

$$66) a_n = (-1)^n + 13$$

66) \_\_\_\_\_

Find the sum if it exists.

$$67) \sum_{i=1}^{\infty} 6 \left( \frac{5}{3} \right)^i$$

67) \_\_\_\_\_

Solve the problem.

68) Mona bought a computer for \$200. She agreed to pay \$50 per month for 4 months, plus 2% interest, on the unpaid balance. Find the total cost of the computer.

68) \_\_\_\_\_

69) A town has a population of 10,000 people and is increasing by 10% every year. What will the population be at the end of 4 years?

69) \_\_\_\_\_

Write the first five terms of the sequence described.

70) Arithmetic, with  $a_1 = 23$ ,  $d = 7$

70) \_\_\_\_\_

71) Geometric, with  $a_4 = 18$  and  $r = \frac{1}{3}$

71) \_\_\_\_\_

Find  $a_4$  for the sequence described.

72) Arithmetic, with  $a_1 = 7$  and  $d = -5$

72) \_\_\_\_\_

**Solve the problem.**

- 73) The number of mutual funds available to investors in Dereguland for each year period the period 1996–2000 is given in the following table. 73) \_\_\_\_\_

Year	Number of Funds Available
1996	3490
1997	4372
1998	4910
1999	5501
2000	6649

To the nearest whole number, what was the average number of funds available during this period?

- 74) If \$1400 is deposited in an ordinary annuity at the end of each quarter for 4 yr and earns 3% interest compounded quarterly, how much will be in the account at the end of this term? 74) \_\_\_\_\_

**Find the sum if it exists.**

75)  $\sum_{i=1}^5 (-3i + 4)$  75) \_\_\_\_\_

76)  $\sum_{i=1}^6 (6i - 3)$  76) \_\_\_\_\_

77)  $\sum_{i=1}^{580} i$  77) \_\_\_\_\_

78)  $\sum_{i=1}^5 \frac{1}{3}(2^i)$  78) \_\_\_\_\_

79)  $\sum_{i=1}^{\infty} \left(\frac{4}{9}\right)^i$  79) \_\_\_\_\_

**Use Pascal's triangle to expand the binomial.**

80)  $(s + t)^3$  80) \_\_\_\_\_

**Evaluate the expression.**

81)  $\frac{6!}{4!}$  81) \_\_\_\_\_

**Use the binomial formula to expand the binomial.**

82)  $(5x + 3)^3$  82) \_\_\_\_\_