



ST. BRENDAN
HIGH SCHOOL

**Honors Statistics and
AP Statistics
Summer Math Packet**

This summer math packet is a review of some of the concepts learned in your previous math classes that will be needed for Statistics and Advanced Placement Statistics. It will assure that all students begin the school year on the same page and with equal opportunity to succeed in class.

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 or Algebra notes or the websites provided to help you if you need reminders on how to complete some 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.mathtv.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.

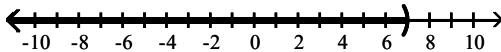
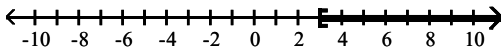
5) $A \cap B$

5) _____

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

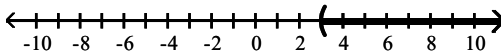
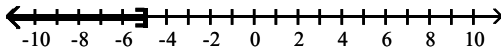
6) Intersection

6) _____



7) Union

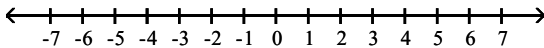
7) _____



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

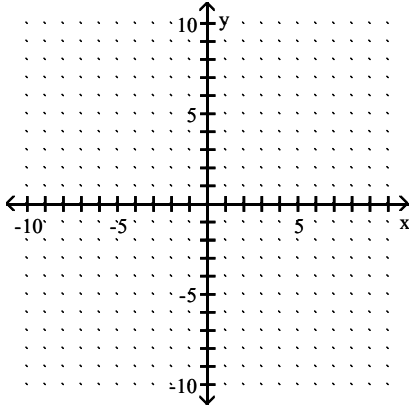
9) _____

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.

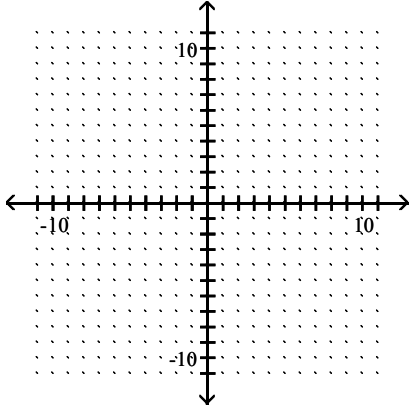
14) The information in the chart gives the salary of a person for the stated years. Use the information for the years 2001 and 2003 to find an equation that models the data. Let $x = 1$ represent 2001, $x = 3$ represent 2003, and y represent the salary. Write the equation in slope-intercept form. Use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

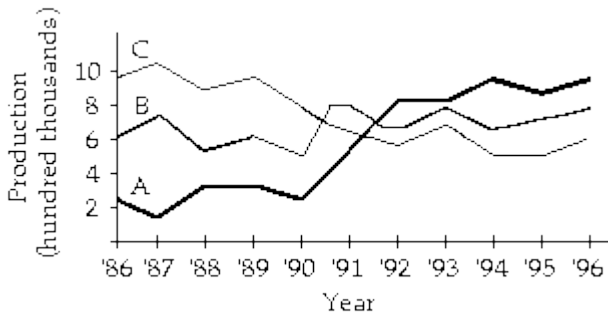
Solve the problem.

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

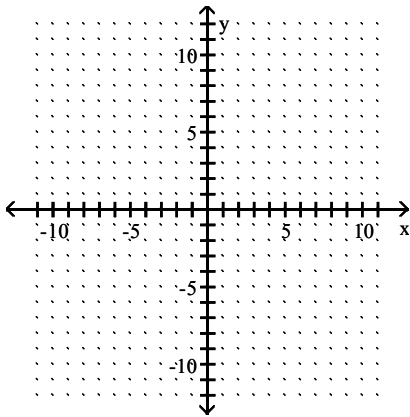
23) $f(x) = 4x + 6$; $f(8)$

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.

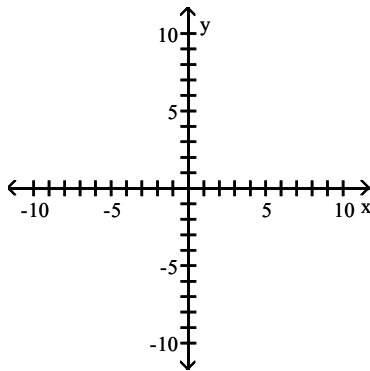
34) Sandi can make a quilt in 9 days and Eva can make a quilt in 6 days. In how many days can they make a quilt working together?

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.

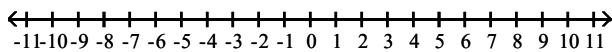
43) Solve $S = \frac{1}{2} \pi r^2 + (r + 5)h$ for r .

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.

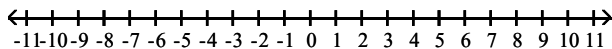
49) $\log_4 64 = 3$

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) _____

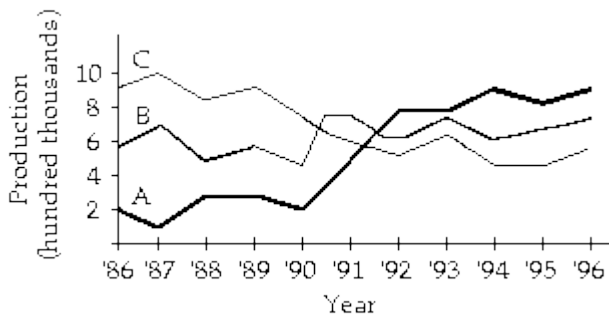
Evaluate the expression.

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.

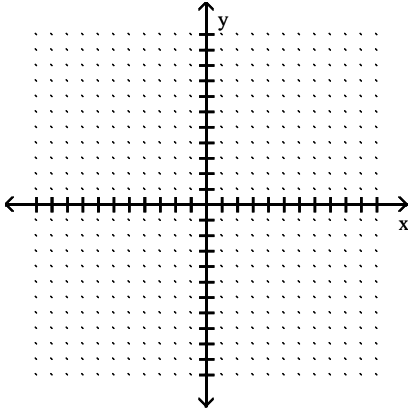
$$61) -[8x + (2x + 9)] = 8 - (5x + 4)$$

61) _____

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

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

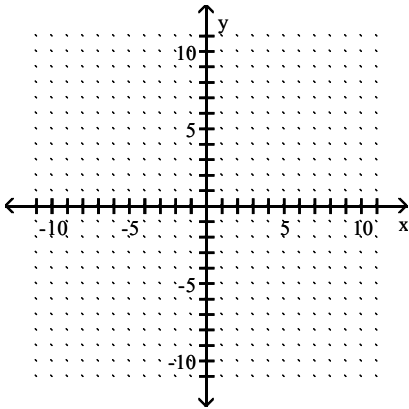
62) _____



Graph.

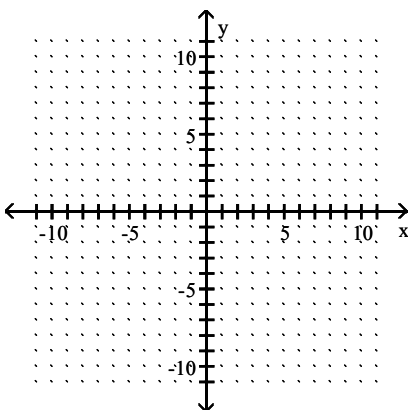
$$63) f(x) = -\sqrt{36 - x^2}$$

63) _____



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

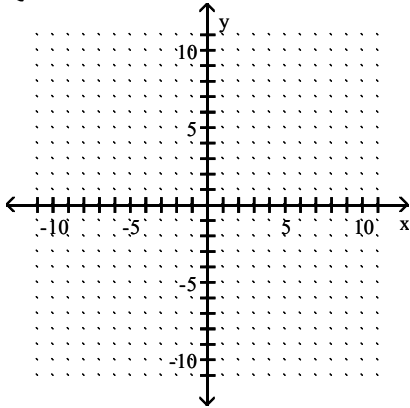
64) _____



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) _____

Evaluate the expression.

83) $\frac{6!}{4! 2!}$

83) _____

84) $\frac{6!}{4! 2!}$

84) _____

Use Pascal's triangle to expand the binomial.

85) $(a + b)^4$

85) _____

86) $(p + q)^5$

86) _____