NAME:_____ PERIOD: ___

AP Statistics Summer Math Packet

Complete all sections of this packet and bring your completed AP Statistics Summer Packet to your first class.

ABOUT THIS SUMMER PACKET:
In general, AP Statistics includes applied concepts rather than pure mathematics in much of the course. That being said, a basic level of algebraic proficiency is expected. This summer packet will test your knowledge of some of these expected skills.

Most students will find the majority of this summer packet relatively easy. Every topic represented in this summer packet will be expected of you throughout the year. This packet will not count towards your course grade, however, your score will be recorded as a record of your basic math skills entering this class.

INSTRUCTIONS:
You should complete this summer packet with assistance from any outside source and without a calculator. You may use any spare space in this packet for work but be sure that your answers are all clearly marked. After this summer packet has been scored, the answers will be made available to you.

PART I: PERCENT, DECIMAL, PROPORTION:

D,

1) The percentage 3% is equivalent to what decimal:
(A) 300 (B) 30 (C) 3 (D) 0.3 (E) 0.03 (F) 0.003

2) The decimal 0.5 is equivalent to what percentage:
(A) 5% (B) 50% (C) 500% (D) 0.5% (E) 0.05% (F) 0.005%

3) "16%" is equivalent to which of the following:
(A) 16 (B) 0.16% (C) 0.016% (D) 0.16 (E) 0.016 (F) 0.0016

E,

4) Statistics students sometimes reason as follows: "Since $\frac{1}{10}$ is 10%, it must be true that $\frac{1}{4}$ is 4%." Is this reasoning correct?

(A) No, because $\frac{1}{10}$ is not 10%.

(B) No, because, although $\frac{1}{10}$ is not 10%, this only works with the number 10.

(C) Yes, this works with 4, although there may be other numbers it won't work with.

(D) Yes, and this will work with any number.

F,

5) Choose the correct words to complete the following sentence:

0.04 is _____ 0.01
(less than equal to greater than)

6) Choose the correct words to complete the following sentence:

0.008 is _____ 0.05
(less than equal to greater than)

7) Choose the correct words to complete the following sentence:

0 is _____ 0.01
(less than equal to greater than)

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Suppose there are 50 people in the room, of which 13 are male. Suppose 7 males in the room are wearing a baseball hat.

8) The proportion of males in the room is:

(A) $\frac{1}{13}$ (B) $\frac{13}{50}$ (C) $\frac{50}{13}$ (D) $\frac{13}{100}$ (E) $\frac{6}{50}$ (F) 13

9) The proportion of males that are wearing a baseball hat is:

(A) $\frac{1}{7}$ (B) $\frac{13}{7}$ (C) $\frac{7}{13}$ (D) $\frac{7}{50}$ (E) $\frac{7}{100}$ (F) 7

10) Out of the whole room, the proportion of baseball-hat-wearing males is:

(A) $\frac{1}{7}$ (B) $\frac{13}{7}$ (C) $\frac{7}{13}$ (D) $\frac{7}{50}$ (E) $\frac{7}{100}$ (F) 7

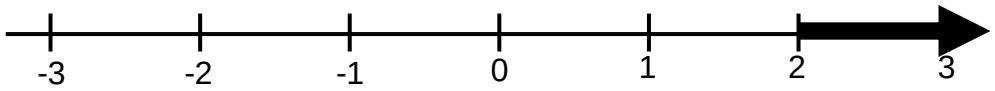
PART II: ALGEBRAIC NOTATION

D,

11) The expression "X ≤ 4" means:

(A) X is greater than 4.
(B) X is at least 4.
(C) X is less than 4.
(D) X is no more than 4.
(E) X is equal to 4.

12) The set of X values represented by the darkened portion of the number line shown below is symbolized by what expression:



(A) X < 2
(B) X > 2
(C) X = 3

13) The expression "0 < X < 1" means:

(A) X can be any number.
(B) X must be greater than 1.
(C) X must be negative.
(D) X can be greater than 1, or negative.
(E) X must be between 0 and 1.
(F) X is either 0 or 1.
(G) Nothing – the expression has no meaning.

E,

14) If P(x) is a function, then the expression “P(x) = y” is properly interpreted to mean:
(A) x represents the input and y represents the output.
(B) x represents the output and y represents the input.
(C) x is multiplied by P to get y.

15) If P(x) is a function, then the expression “P(x=3) = 0.01” is shorthand for:
(A) When the input is 3, the output is 0.01.
(B) When the input is 0.01, the output is 3.
(C) x can equal 3 or 0.01.

(C)

16) The expression $(\frac{i}{9})$ is shorthand for:

(A) The following sum of two terms: $\frac{1}{9}+\frac{5}{9}$

(B) The following sum of three terms: $\frac{1}{9}+\frac{2}{9}+\frac{5}{9}$

(C) The following sum of five terms: $\frac{1}{9}+\frac{1}{9}+\frac{1}{9}+\frac{1}{9}+\frac{1}{9}$

(D) The following sum of five terms: $\frac{1}{9}+\frac{2}{9}+\frac{3}{9}+\frac{4}{9}+\frac{5}{9}$

(E) The following sum of five terms: $\frac{5}{9}+\frac{5}{9}+\frac{5}{9}+\frac{5}{9}+\frac{5}{9}$

(F) The following sum of five terms:

17) Supposing that:

x_1 stands for 6,
x_2 stands for 8,
x_3 stands for 15,
x_4 stands for 7,

then the expression $\sum_{i=1}^{4} (x_i - 9)$ is shorthand for:

(A) The following quantity: (1 + 2 + 3 + 4) - 9
(B) The following quantity: (6 + 8 + 15 + 7) - 9
(C) The following quantity: (x + x + x + x) - 9
(D) The following quantity: (1 – 9) + (2 – 9) + (3 – 9) + (4 – 9)
(E) The following quantity: (6 – 9) + (8 – 9) + (15 – 9) + (7 – 9)
(F) The following quantity: (x – 9) + (x – 9) + (x – 9) + (x – 9)
(G) The single quantity (x – 9)
(H) Either (1 – 9) or (4 – 9)
(I) Either (6 – 9) or (7 – 9)

18) Supposing that:

x_1 stands for 6,
x_2 stands for 8,
x_3 stands for 15,
x_4 stands for 7,

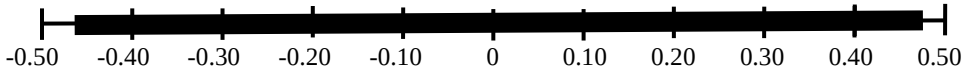
then the expression $\sum_{i=1}^{4} (x_i)^2$ is shorthand for:

(A) The following quantity: $(1 + 2 + 3 + 4)^2$
(B) The following quantity: $(6 + 8 + 15 + 7)^2$
(C) The following quantity: $(x + x + x + x)^2$
(D) The following quantity: $(1)^2 + (2)^2 + (3)^2 + (4)^2$
(E) The following quantity: $(6)^2 + (8)^2 + (15)^2 + (7)^2$
(F) The following quantity: $(x)^2 + (x)^2 + (x)^2 + (x)^2$
(G) Since (A) and (D) represent the same quantity, they are both correct.
(H) Since (B) and (E) represent the same quantity, they are both correct.
(I) Since (C) and (F) represent the same quantity, they are both correct.

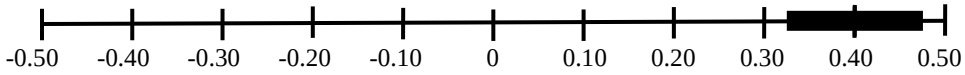
(D) **-**

19) Suppose there is an interval on the x-axis. If the expression 0.40 ± 0.07 expresses the interval's endpoints, then the interval is:

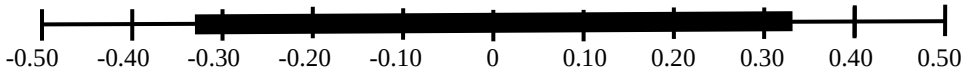
(A) The interval whose left-hand endpoint is at negative 0.47 and whose right-hand endpoint is at positive 0.47, as represented in the following figure:



(B) The interval whose left-hand endpoint is at positive 0.33 and whose right-hand endpoint is at positive 0.47, as represented in the following figure:



(C) The interval whose left-hand endpoint is at negative 0.33 and whose right-hand endpoint is at positive 0.33, as represented in the following figure:



PART III: ALGEBRA MANIPULATIONS AND UNDERSTANDING.

D,

20) Solve for the variable b in the following equation:

$$a = \frac{b-c}{d}$$

21) Solve for the variable d in the following equation:

$$a = b * \frac{c}{\sqrt{d}}$$

22) Suppose the number of people, y, on a bus, as a function of time, x, (in minutes), is given the equation y = 4 + 2x. The number of people on the bus after 20 minutes would be obtained by:

(A) Substituting 20 for y, and solving for x.
(B) Substituting 20 for x, and simplifying.
(C) No substitution is needed; the answer would be 20.

23) The answer to the previous question (how many people are on the bus after 20 minutes) is:

(A) 20 people
(B) 120 people
(C) 44 people
(D) 8 people
(E) 32 people
(F) 12 people
(G) 48 people

24) Suppose the number of people, y, on a bus, as a function of time, x, (in minutes), is given by the equation y = 4 + 2x. The time when there were 20 people on the bus would be obtained by:

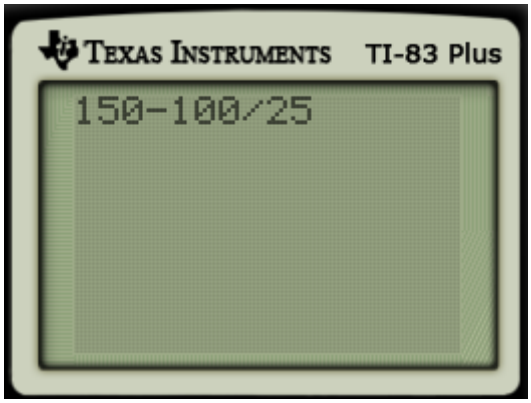
(A) Substituting 20 for y, and solving for x.
(B) Substituting 20 for x, and simplifying.
(C) No substitution is needed; the answer would be 20.

25) The answer to the previous question (how many people are on the bus after 20 minutes) is:

(A) 20 minutes
(B) 120 minutes
(C) 44 minutes
(D) 8 minutes
(E) 32 minutes
(F) 12 minutes
(G) 48 minutes

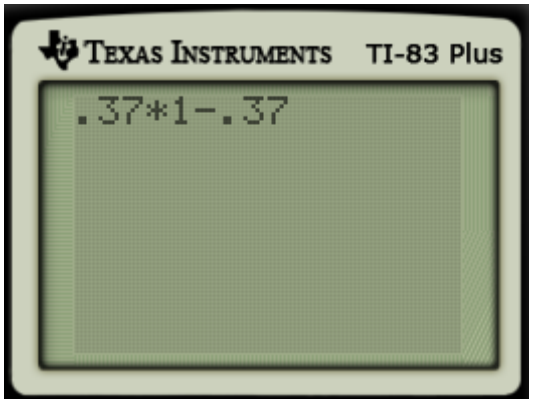
E, -of-operations on a calculator:

26) Suppose I want to use a calculator to evaluate the expression $\frac{150-100}{25}$. If I type:



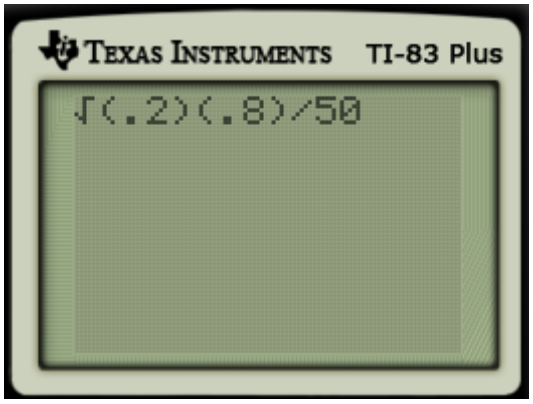
Will I get the intended answer? Why or why not? If not, how should I have entered the expression?

27) Suppose I want to use a calculator to evaluate the expression (.37)(1-.37). If I type:



Will I get the intended answer? Why or why not? If not, how should I have entered the expression?

28) Suppose I want to use a calculator to evaluate the expression $\sqrt{\frac{(.2)(.8)}{50}}$. If I type:



Will I get the intended answer? Why or why not? If not, how should I have entered the expression?

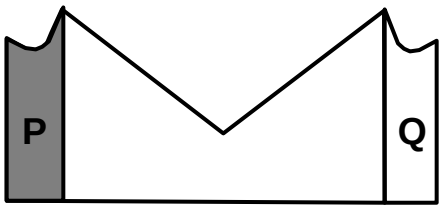
29) Suppose I want to use a calculator to evaluate the expression $\frac{2}{5/10}$. If I type:

Will I get the intended answer? Why or why not? If not, how should I have entered the expression?

TBT1 0 0 1 252.05 T0 q76 450.79 Tm[( )] TJET EMC /P2561.4T1 0 0 1 252.05 T0 q76 450.79 Tm 13>> BDC BT1 0 0 /P12.8

32) Suppose the following shape is perfectly symmetric, left-to-right, and suppose the total area of the entire shape is 100 units^2. If the thin, left-side shaded portion labeled "P" in the following picture is 5 units^2, which of the following gives the area of just the thin right-side portion labeled "Q"?

(A) Q = 100 + 5
(B) Q = 100 – 5
(C) Q = 50 – 5
(D) Q = 2(100 – 5)
(E) Q = 200 – 5
(F) Q = 5



E,

33) In the standard 2-dimensional coordinate system, which of the following is typically true?
(A) The horizontal axis is "x", and the vertical axis is "y".
(B) The vertical axis is "x", and the horizontal axis is "y".
(C) Both axes (horizontal and vertical) are "x".
(D) Both axes (horizontal and vertical) are "y".

34) In the standard 2-dimensional coordinate system, which of the following is generally true?
(A) The horizontal variable is the "output", and the vertical variable is the "input".
(B) The vertical variable is the "output", and the horizontal variable is the "input".
(C) Both variables (horizontal and vertical) are "output".

35) In the standard 2-dimensional coordinate system, the point notation "(2, 5)" would represent:
(A) A single point 2 units to the right and 5 units above the origin.
(B) A single point 5 units to the right and 2 units above the origin.
(C) Two points, one 2 units to the right of the origin and the other 5 units above the origin.
(D) Two points, one 5 units to the right of the origin and the other 2 units above the origin.

PART V: STRAIGHT LINES.

D,

36) A straight line whose graph *rises* from left to right:
(A) Must have a negative slope.
(B) Must have a positive slope.
(C) Must have a slope of zero.

37) A straight line whose graph *falls* from left to right:
(A) Must have a negative slope.
(B) Must have a positive slope.
(C) Must have a slope of zero.

38) There are two lines, the first having slope of 20, and the second having slope of 0.02. Then:
(A) The graph of the first line *rises* from left to right, but the graph of the second line *falls*.
(B) The graph of both lines rise from left to right, but the first line is steeper than the second.
(C) The graph of both lines rise from left to right, but the second line is steeper than the first.

E,

39) Suppose I record the number of people in a bus over several minutes, so that the output, y, "number of people" is a linear function of the input, x, "time" (in minutes); and suppose the slope of the line is positive. Then:

(A) As each minute goes by, the number of people decreases.
(B) As each minute goes by, the number of people increases.
(C) As each minute goes by, the number of people does not change.

40) Suppose I place books on a scale, so that the output, y, "weight" (in pounds) is a linear function of the input, x, "number of books"; and suppose the slope of the line is 0.1. Then:

(A) As each one book is added, the weight *increases* by ten pounds.
(B) As each one book is added, the weight *increases* by only a tenth of a pound.
(C) As each one book is added, the weight *increases* by one pound.
(D) As more books are added, the weight *decreases*.

41) Suppose I place books on a scale, so that the output, y, "weight" (in pounds) is a linear function of the input, x, "number of books"; and suppose the slope of the line is 10. Then:

(A) As each one book is added, the weight *increases* by ten pounds.
(B) For every ten books that are added, the weight *increases* by only one pound.
(C) For every ten books that are added, the weight *increases* by ten pounds.
(D) As more books are added, the weight *decreases*.

42) Suppose I record the number of people in a bus over several minutes, so that the output, y, "number of people" is a linear function of the input, x, "time" (in minutes); and suppose the slope of the line is zero. Then:

(A) As each minute goes by, the number of people on the bus *increases*.
(B) As each minute goes by, the number of people on the bus *decreases*.
(C) As each minute goes by, the number of people on the bus remains constant.
(D) As each minute goes by, the number of people on the bus goes to zero.

F, **-intercept, graphically:**

43) A straight line with y-intercept of 5:

(A) Passes through the point where x=0 and y=0.
(B) Passes through the point where x=5 and y=0.
(C) Passes through the point where x=0 and y=5.
(D) Passes through the point where x=5 and y=5.
(E) Passes through the point where x=-5 and y=5.

44) A straight line with y-intercept of 4:

(A) Must cross the horizontal axis 4 units to the left of the origin.
(B) Must cross the horizontal axis 4 units to the right of the origin.
(C) Must cross the vertical axis 4 units above the origin.
(D) Must cross the vertical axis 4 units below the origin.
(E) Must pass through the origin.

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-intercept, conceptually:

45) Suppose I record the number of people in a bus over several minutes, so that the output, y, "number of people" is a linear function of the input, x, "time" (in minutes). If the y-intercept is 5, this means:

(A) When I began, my watch read "5 minutes".
(B) When I began, there were 5 people on the bus.
(C) As each minute goes by, the number of people increases by 5.
(D) As each minute goes by, the number of people decreases by 5.

46) Suppose I place books on a scale, so that the output, y, "weight" (in pounds) is a linear function of the input, x, "number of books". If the y-intercept is 3, this means:

(A) As each book is added, the weight increases by 3 pounds.
(B) As each book is added, the weight decreases by 3 pounds.
(C) With no books, the scale reads "3 pounds".
(D) With 3 books, the scale reads "0 pounds".

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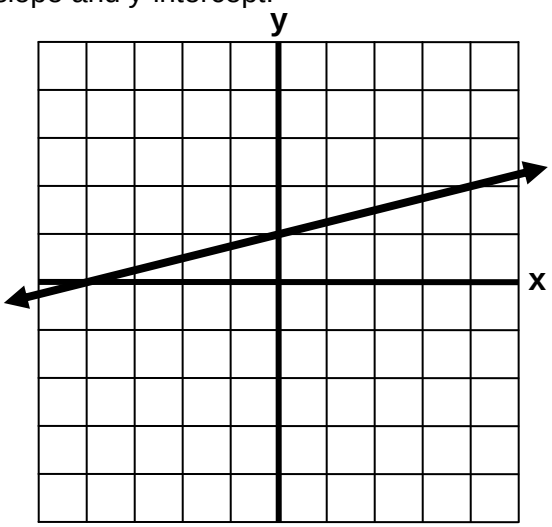
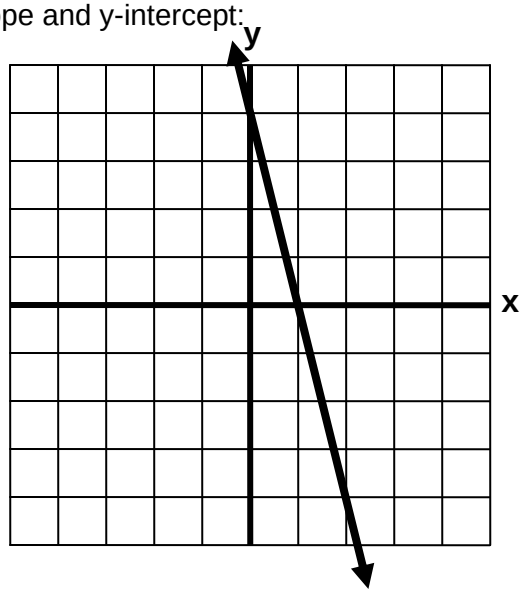
47) For the following line pictured, choose the correct slope and y-intercept:

SLOPE:	Y-INTERCEPT
(A) -4	(A) -4
(B) -1	(B) -1
(C) -0.25	(C) -0.25
(D) 0	(D) 0
(E) 4	(E) 4
(F) 1	(F) 1
(G) 0.25	(G) 0.25
(H) Undefined	(H) Does not exist
(I) Both "0" and "undefined"	



48) For the following line pictured, choose the correct slope and y-intercept:

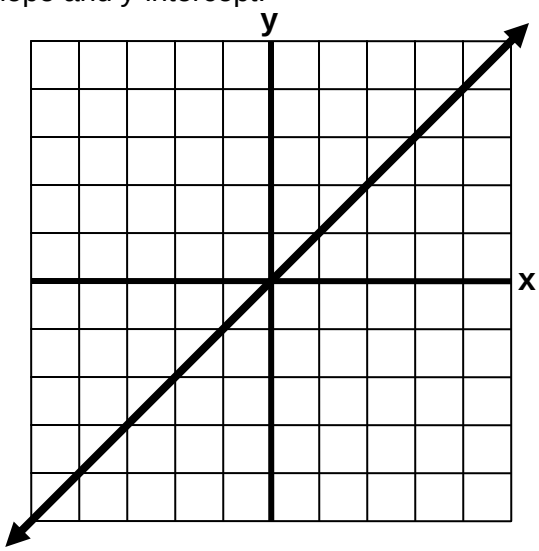
SLOPE:	Y-INTERCEPT
(A) -4	(A) -4
(B) -1	(B) -1
(C) -0.25	(C) -0.25
(D) 0	(D) 0
(E) 4	(E) 4
(F) 1	(F) 1
(G) 0.25	(G) 0.25
(H) Undefined	(H) Does not exist
(I) Both "0" and "undefined"	



49) For the following line pictured, choose the correct slope and y-intercept:

SLOPE:
(A) -4
(B) -1
(C) -0.25
(D) 0
(E) 4
(F) 1
(G) 0.25
(H) Undefined
(I) Both “0” and “undefined”

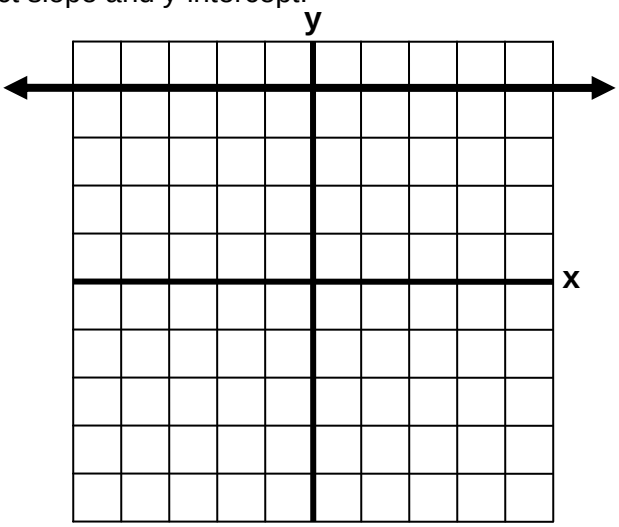
Y-INTERCEPT
(A) -4
(B) -1
(C) -0.25
(D) 0
(E) 4
(F) 1
(G) 0.25
(H) Does not exist



50) For the following line pictured, choose the correct slope and y-intercept:

SLOPE:
(A) -4
(B) -1
(C) -0.25
(D) 0
(E) 4
(F) 1
(G) 0.25
(H) Undefined
(I) Both “0” and “undefined”

Y-INTERCEPT
(A) -4
(B) -1
(C) -0.25
(D) 0
(E) 4
(F) 1
(G) 0.25
(H) Does not exist



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51) In algebra, straight lines are often written in the form “y = slope(x) + intercept”. But in statistics, the x term is written last: “y = intercept + slope(x)”. Using the statistics form, the equation of a line with slope 3 and y-intercept of 4 is:

(A) y = 3 + 4x
(B) y = 3 + 4
(C) y = 4 + 3
(D) y = 4 + 3x
(E) y = 3(4x)

52) In algebra, straight lines are often written in the form “y = slope(x) + intercept”. But in statistics, the x term is written last: “y = intercept + slope(x)”. In the equation y = -2 + 0.75x, the slope