

MATH 1332 FINAL EXAM REVIEW

Name \_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Are the sets equivalent?

1)  $A = \{6, 7, 8, 9, 10\}$

$B = \{5, 6, 7, 8, 9\}$

A) Yes

B) No

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

Fill in the blank with either  $\in$  or  $\notin$  to make the statement true.

2)  $0$  \_\_\_\_\_  $\emptyset$

A)  $\in$

B)  $\notin$

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

Let  $U = \{21, 22, 23, 24, \dots\}$ ,  $A = \{21, 22, 23, 24, \dots, 40\}$ ,  $B = \{21, 22, 23, 24, \dots, 50\}$ ,  $C = \{22, 24, 26, 28, \dots\}$ , and  $D = \{21, 23, 25, 27, \dots\}$ .

Use the roster method to write the following set.

3)  $C'$

A)  $C' = \{21, 22, 23, 24, \dots\}$

B)  $C' = \{21, 23, 25, 27, \dots\}$

C)  $C' = \{22, 24, 26, 28, \dots\}$

D)  $C' = \{21, 23, 25, 27, \dots, 39\}$

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

Let  $U = \{q, r, s, t, u, v, w, x, y, z\}$

$A = \{q, s, u, w, y\}$

$B = \{q, s, y, z\}$

$C = \{v, w, x, y, z\}$ . List the elements in the set.

4)  $(A \cup B)'$

A)  $\{t, v, x\}$

B)  $\{s, u, w\}$

C)  $\{r, t, v, x\}$

D)  $\{r, s, t, u, v, w, x, z\}$

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

5)  $(A \cap B \cap C)'$

A)  $\{q, s, u, w, z\}$

B)  $\emptyset$

C)  $\{q, r, s, t, u, v, w, x, z\}$

D)  $\{r, t, v, x\}$

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

Use a Venn diagram to answer the question.

6) At East Zone University (EZU) there are 730 students taking College Algebra or Calculus. 427 are taking College Algebra, 366 are taking Calculus, and 63 are taking both College Algebra and Calculus. How many are taking Algebra but not Calculus?

A) 364

B) 303

C) 301

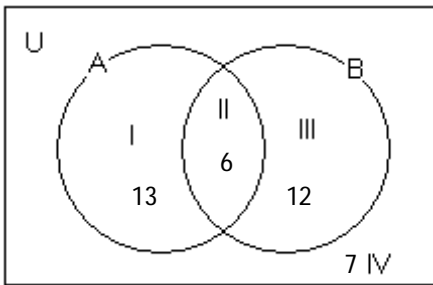
D) 667

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

Use the accompanying Venn diagram that shows the number of elements in regions I through IV to answer the question.

7)

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



How many elements belong to set B?

A) 25

B) 12

C) 19

D) 18

Use  $\subseteq$ ,  $\not\subseteq$ ,  $\subset$ , or both  $\subset$  and  $\subseteq$  to make a true statement.

8)  $\{11, 12, 13\}$  \_\_\_\_\_  $\{11, 12, 13\}$

A)  $\subset$  and  $\subseteq$

B)  $\not\subseteq$

C)  $\subset$

D)  $\subseteq$

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

Write  $\subseteq$  or  $\not\subseteq$  in the blank so that the resulting statement is true.

9)  $\left\{ \frac{9}{13}, \frac{5}{7} \right\}$  \_\_\_\_\_  $\left\{ \frac{13}{9}, \frac{7}{5} \right\}$

A)  $\subseteq$

B)  $\not\subseteq$

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

Use a Venn diagram to answer the question.

10) At East Zone University (EZU) there are 924 students taking College Algebra or Calculus. 438 are taking College Algebra, 569 are taking Calculus, and 83 are taking both College Algebra and Calculus. How many are taking Algebra but not Calculus?

A) 841

B) 272

C) 486

D) 355

10) \_\_\_\_\_

Construct a truth table for the statement.

11)  $\sim(p \vee q) \wedge \sim p$

A)

p	q	$p \vee q$	$\sim(p \vee q)$	$\sim p$	$\sim(p \vee q) \wedge \sim p$
T	T	T	F	F	F
T	F	T	F	F	F
F	T	T	F	T	T
F	F	F	T	T	T

B)

p	q	$p \vee q$	$\sim(p \vee q)$	$\sim p$	$\sim(p \vee q) \wedge \sim p$
T	T	T	F	F	F
T	F	T	F	F	F
F	T	T	F	T	F
F	F	F	T	T	T

C)

p	q	$p \wedge q$	$\sim(p \vee q)$	$\sim p$	$\sim(p \wedge q) \wedge \sim p$
T	T	T	F	F	F
T	F	F	T	F	F
F	T	F	T	T	T
F	F	F	T	T	F

D)

p	q	$p \vee q$	$\sim(p \vee q)$	$\sim p$	$\sim(p \vee q) \wedge \sim p$
T	T	T	F	F	F
T	F	T	F	F	F
F	T	T	F	T	T
F	F	F	T	T	T

11) \_\_\_\_\_

12) $(q \rightarrow \sim p) \rightarrow (q \wedge \sim p)$		12) _____																														
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Express the quantified statement in an equivalent way, that is, in a way that has exactly the same meaning.

- 13) All uncles are males. 13) \_\_\_\_\_
- A) All males are not uncles.                      B) There are no uncles that are not males.
- C) Some males are not uncles.                    D) At least one uncle is a male.

Express the symbolic statement  $\sim p$  in words.

- 14) p: The Pilgrims did not land in Tahiti. 14) \_\_\_\_\_
- A) The Pilgrims landed in Tahiti.
- B) It is not true that the Pilgrims landed in Tahiti.
- C) The Pilgrims landed on Plymouth Rock.
- D) The Pilgrims almost landed in Tahiti.

Given that p and q each represents a simple statement, write the indicated compound statement in its symbolic form.

- 15) p: Spartacus is a film. 15) \_\_\_\_\_  
q: Rambo is a film.  
Spartacus is a film and Rambo is a film.
- A)  $p \wedge \sim q$                       B)  $p \vee q$                       C)  $p \wedge q$                       D)  $p \rightarrow q$

Let p represent a true statement, while q and r represent false statements. Find the truth value of the compound statement.

- 16)  $(p \wedge \sim q) \wedge r$  16) \_\_\_\_\_
- A) True    B) False

Use De Morgan's laws to write a negation of the statement.

- 17) A man eats six hot dogs and he does not get a stomach ache. 17) \_\_\_\_\_
- A) A man eats six hot dogs and he gets a stomach ache.
- B) A man eats six hot dogs or he gets a stomach ache.
- C) A man does not eat six hot dogs or he does not get a stomach ache.
- D) A man does not eat six hot dogs or he gets a stomach ache.

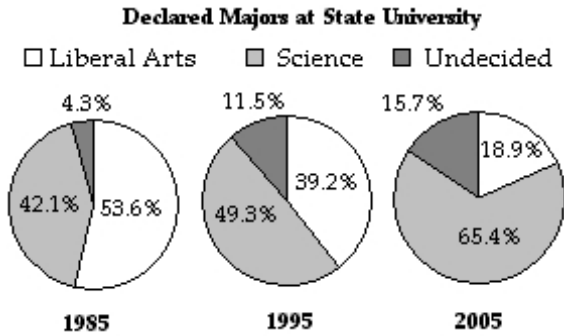
Use a truth table to determine whether the two statements are equivalent.

- 18)  $\sim p \vee \sim q$  and  $\sim(p \wedge q)$  18) \_\_\_\_\_
- A) Yes    B) No

Write the negation of the conditional statement.

- 19) If it is red, then it is not an egg. 19) \_\_\_\_\_
- A) It is not red and it is not an egg.                      B) It is red and it is not an egg.
- C) It is not red and it is an egg.                              D) It is red and it is an egg.

Use the information in the graphs to determine the truth value of the compound statement.



- 20) It is not true that in 1985, 53.6% of declared majors were liberal arts and 40.3% were science. 20) \_\_\_\_\_  
 A) True B) False

Determine all values of  $d$  that make the statement true.

- 21)  $4 \mid 39,419,72d$  21) \_\_\_\_\_  
 A) 0, 4, 8 B) 0 C) 2, 6 D) 4

Determine if the statement is true or false. Do not use a calculator.

- 22)  $160 \cdot 18 + 34 \cdot 18 = (160 + 34) \cdot 18$  22) \_\_\_\_\_  
 A) True B) False

Express the sentence as a single numerical expression. Then use the order of operations to simplify the expression.

- 23) Subtract 22 from 20. Multiply this difference by 2. Raise this product to the fourth power. 23) \_\_\_\_\_  
 A) 256 B) -64 C) 16 D) -256

Find the greatest common divisor of the numbers.

- 24) 42, 126 24) \_\_\_\_\_  
 A) 14 B) 42 C) 6 D) 21

Find the indicated sum.

- 25)  $2, 4, 6, 8, \dots; S_{52}$  25) \_\_\_\_\_  
 A) 2808 B) 2756 C) 106 D) 2761

Find the indicated term for the geometric sequence with first term,  $a_1$ , and common ratio,  $r$ .

- 26) Find  $a_6$ , when  $a_1 = 12, r = -\frac{1}{3}$ . 26) \_\_\_\_\_  
 A) 10 B)  $\frac{4}{243}$  C)  $-\frac{4}{81}$  D)  $\frac{7}{3}$

Perform the indicated operation. Simplify the answer when possible.

- 27)  $\sqrt{2} + 2\sqrt{98} - 4\sqrt{8}$  27) \_\_\_\_\_  
 A)  $7\sqrt{2}$  B)  $-2\sqrt{2}$  C)  $-2\sqrt{108}$  D)  $7\sqrt{108}$

28)  $\frac{\sqrt{45}}{2} + \frac{\sqrt{20}}{7}$  28) \_\_\_\_\_

A)  $\frac{25\sqrt{5}}{14}$       B)  $\frac{25\sqrt{5}}{7}$       C)  $\frac{5\sqrt{5}}{14}$       D)  $\frac{25\sqrt{5}}{9}$

Rationalize the denominator.

29)  $\frac{7}{\sqrt{2}}$  29) \_\_\_\_\_

A)  $\frac{7\sqrt{2}}{2}$       B)  $\frac{49\sqrt{2}}{2}$       C)  $7\sqrt{2}$       D) 11

Reduce the rational number to its lowest terms.

30)  $\frac{39}{48}$  30) \_\_\_\_\_

A)  $\frac{13}{16}$       B)  $\frac{13}{3}$       C)  $\frac{3}{16}$       D)  $\frac{39}{48}$

Solve the problem.

31) Two toy cars race around a circular track (both go in the same direction). One car can travel around the track in 10 seconds. The other car travels around the track in 15 seconds. If both cars start from the same place, how long will it take for them to meet at the same place if they continue to race?  
 A) 75 seconds      B) 50 seconds      C) 30 seconds      D) 150 seconds

32) Suppose that the luxury sales tax rate in a foreign country is 24%. A very wealthy socialite bought a diamond tiara for \$157,000. How much tax does she pay?  
 A) \$377      B) \$6542      C) \$37,680      D) \$3768

33) 20% of what number is 90?  
 A) 4500      B) 450      C) 18      D) 45

34) Lonnie needs extra money to buy a truck to start up a delivery service. He takes out a simple interest loan for \$6000.00 for 6 months at a rate of 7.25%. How much interest must he pay, and what is the future value of the loan?  
 A) interest: \$2610.00 ; future value: \$8610.00      B) interest: \$237.27 ; future value: \$6237.27  
 C) interest: \$217.50 ; future value: \$6230.50      D) interest: \$217.50 ; future value: \$6217.50

35) Suppose Carla has \$13,000 to invest. Which investment yields the greater return over 3 years: 7% compounded monthly or 6.85% compounded daily?  
 A) The rate of 7% compounded monthly is better.  
 B) They are the same.  
 C) The rate of 6.85% compounded daily is better.

36) The price of a home is \$250,000. The bank requires a 10% down payment. After the down payment, the balance is financed with a 15-year fixed-rate mortgage at 5.5%. Determine the monthly mortgage payment (excluding escrowed taxes and insurance) to the nearest dollar.  
 A) \$1853      B) \$1838      C) \$1826      D) \$1938

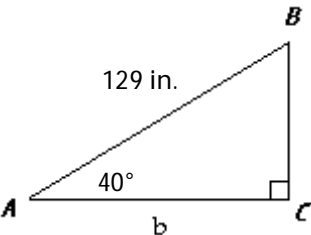


Use the table to calculate the income tax owed.

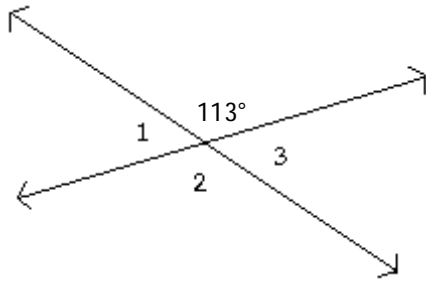
2008 Marginal Tax Rates, Standard Deductions, and Exemptions				
Tax Rate	Single	Married Filing Separately	Married Filing Jointly	Head of Household
10%	up to \$8025	up to \$8025	up to \$16,050	up to \$11,450
15%	\$8026 to \$32,550	\$8026 to \$32,550	\$16,051 to \$65,100	\$11,451 to \$43,650
25%	\$32,551 to \$78,850	\$32,551 to \$65,725	\$65,101 to \$131,450	\$43,651 to \$112,650
28%	\$78,851 to \$164,550	\$65,726 to \$100,150	\$131,451 to \$200,300	\$112,651 to \$182,400
33%	\$164,551 to \$357,700	\$100,151 to \$178,850	\$200,301 to \$357,700	\$182,401 to \$357,700
35%	more than \$357,700	more than \$178,850	more than \$357,700	more than \$357,700
Standard Deduction	\$5450	\$5450	\$10,900	\$8000
Exemptions (per person)	\$3500	\$3500	\$3500	\$3500

- 40) Single female, no dependents 40) \_\_\_\_\_  
 Gross Income: \$35,000  
 Adjustments: \$3000  
 Deductions:  
     \$2000 charitable contributions  
     \$2500 student loan interest  
 Tax credit: none  
 A) \$4915.25                      B) \$3056.25                      C) \$3136.25                      D) \$3570

Find the measure of the side of the right triangle whose length is designated by the lowercase letter. Round your answer to the nearest whole number.

- 41) 41) \_\_\_\_\_
- 
- A) 88 in.                      B) 99 in.                      C) 92 in.                      D) 94 in.

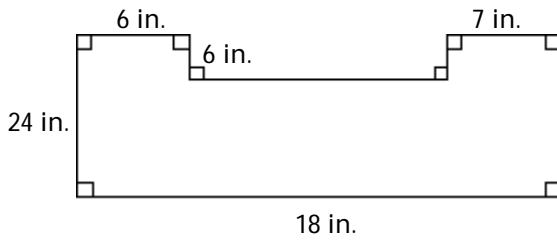
Find the measures of angles 1, 2, and 3. 42) \_\_\_\_\_



- A)  $m\angle 1 = 113^\circ$ ,  $m\angle 2 = 23^\circ$ ,  $m\angle 3 = 113^\circ$                       B)  $m\angle 1 = 23^\circ$ ,  $m\angle 2 = 113^\circ$ ,  $m\angle 3 = 23^\circ$   
 C)  $m\angle 1 = 113^\circ$ ,  $m\angle 2 = 67^\circ$ ,  $m\angle 3 = 113^\circ$                       D)  $m\angle 1 = 67^\circ$ ,  $m\angle 2 = 113^\circ$ ,  $m\angle 3 = 67^\circ$

Find the perimeter of the figure shown. Express the perimeter in the same unit of measure that appears on the given side or sides.

43)



A) 72 in.

18 in.

B) 90 in.

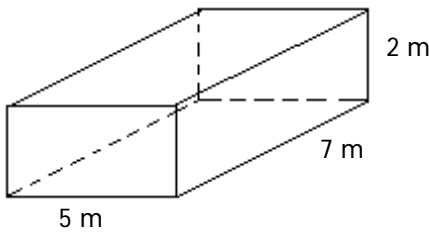
C) 109 in.

D) 96 in.

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

Find the surface area of the figure.

44)



A) 140 m<sup>2</sup>

B) 118 m<sup>2</sup>

C) 70 m<sup>2</sup>

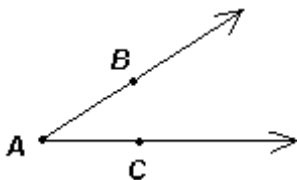
D) 59 m<sup>2</sup>

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

Provide the following information.

- Name the vertex of the angle.
- Name the sides of the angle.
- Name the angle in three different ways.

45)



A) a. point C

b.  $\overrightarrow{AB}$  and  $\overrightarrow{AC}$

c.  $\angle A$ ,  $\angle ABC$ ,  $\angle CAB$

C) a. point C

b.  $\overrightarrow{BA}$  and  $\overrightarrow{CA}$

c.  $\angle A$ ,  $\angle BAC$ ,  $\angle ABC$

B) a. point BAC

b.  $\overrightarrow{BA}$  and  $\overrightarrow{CA}$

c.  $\angle A$ ,  $\angle BAC$ ,  $\angle CAB$

D) a. point A

b.  $\overrightarrow{AB}$  and  $\overrightarrow{AC}$

c.  $\angle A$ ,  $\angle BAC$ ,  $\angle CAB$

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

Solve the problem.

46) What will it cost to tile a rectangular floor measuring 297 feet by 38 feet if the tile costs \$14 per square foot?

A) \$349

B) \$9380

C) \$11,286

D) \$158,004

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

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

47) What is the volume of a rectangular storage facility that is 75 feet tall, 80 feet wide and 15 feet tall?

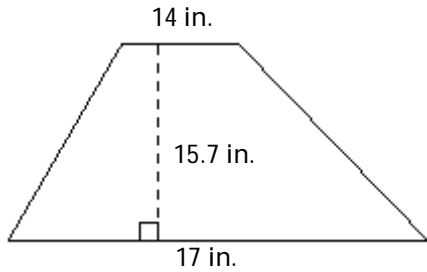
47) \_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Use formulas to find the area of the figure.

48)

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



A)  $486.7 \text{ in.}^2$

B)  $219.8 \text{ in.}^2$

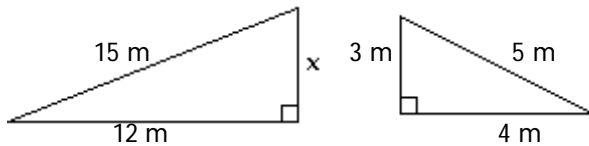
C)  $243.35 \text{ in.}^2$

D)  $266.9 \text{ in.}^2$

Use similar triangles and the fact that corresponding sides are proportional to find the length of the side marked with an x.

49)

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



A) 3 m

B) 9 m

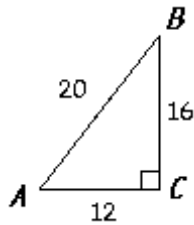
C) 12 m

D) 5 m

Use the given right triangle to find the trigonometric function.

50)  $\cos B$

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



A)  $\frac{3}{4}$

B)  $\frac{4}{5}$

C)  $\frac{3}{5}$

D)  $\frac{5}{4}$

Evaluate the factorial expression.

51)  $\frac{700!}{699!}$

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

A) 489,300

B) 700

C) 1

D) 699

Solve the problem by applying the Fundamental Counting Principle with two groups of items.

52) A restaurant offers a choice of 4 salads, 5 main courses, and 4 desserts. How many possible 3-course meals are there?

52) \_\_\_\_\_

A) 13

B) 80

C) 20

D) 160

Solve the problem involving probabilities with independent events.

53) The probability that a region prone to hurricanes will be hit by a hurricane in any single year is  $\frac{1}{5}$ . 53) \_\_\_\_\_

What is the probability of a hurricane at least once in the next 5 years?

- A) 0.00032                      B) 0.99968                      C) 0.67232                      D) 1

Solve the problem.

54) A group consists of 6 men and 5 women. Three people are selected to attend a conference. In how many ways can 3 people be selected from this group of 11? In how many ways can 3 men be selected from the 6 men? Find the probability that the selected group will consist of all men. 54) \_\_\_\_\_

- A) 165; 20;  $\frac{1}{5940}$                       B) 165; 20;  $\frac{1}{4838400}$   
C) 990; 120;  $\frac{4}{33}$                       D) 165; 20;  $\frac{4}{33}$

55) Numbered disks are placed in a box and one disk is selected at random. If there are 6 red disks numbered 1 through 6, and 2 yellow disks numbered 7 through 8, find the probability of selecting a red disk, given that an odd-numbered disk is selected. 55) \_\_\_\_\_

- A)  $\frac{3}{8}$                       B)  $\frac{1}{8}$                       C)  $\frac{3}{4}$                       D)  $\frac{1}{4}$

56) A store specializing in electronics is to open in one of two malls. If the first mall is selected, the store anticipates a yearly profit of \$300,000 if successful and a yearly loss of 110,000 otherwise. The probability of success is  $\frac{1}{2}$ . If the second mall is selected, it is estimated that the yearly profit will be \$110,000 if successful; otherwise, the annual loss will be \$60,000. The probability of success at the second mall is  $\frac{3}{4}$ . What is the expected profit at each of the two malls? 56) \_\_\_\_\_

- A) first mall: \$122,500; second mall: \$67,500                      B) first mall: \$122,500; second mall: \$40,000  
C) first mall: \$95,000; second mall: \$40,000                      D) first mall: \$95,000; second mall: \$67,500

Use the formula for  ${}_nC_r$  to evaluate the expression.

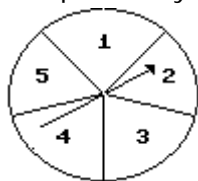
57)  $7C_1$  57) \_\_\_\_\_  
A) 5040                      B) 7                      C) 3.5                      D) 1440

Use the theoretical probability formula to solve the problem. Express the probability as a fraction reduced to lowest terms.

58) You are dealt one card from a standard 52-card deck. Find the probability of being dealt a picture card. 58) \_\_\_\_\_

- A)  $\frac{3}{26}$                       B)  $\frac{1}{13}$                       C)  $\frac{3}{52}$                       D)  $\frac{3}{13}$

59) Use the spinner below to answer the question. Assume that it is equally probable that the pointer will land on any one of the five numbered spaces. If the pointer lands on a borderline, spin again. Find the probability that the arrow will land on 3 or 4. 59) \_\_\_\_\_



- A)  $\frac{4}{3}$                       B)  $\frac{2}{5}$                       C) 3                      D) 1

You are dealt one card from a 52-card deck. Find the probability that you are dealt:

60) a numbered card or a club 60) \_\_\_\_\_

- A)  $\frac{23}{52}$                       B)  $\frac{10}{13}$                       C)  $\frac{53}{52}$                       D)  $\frac{33}{52}$

Find the a. mean and b. standard deviation for the data set. Round to two decimal places.

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

Country	Number of Television Sets per 100 people
A	110
B	80
C	115
D	95
E	100

- A) a. 99 b. 13.69                      B) a. 100 b. 13.69                      C) a. 100 b. 169                      D) a. 101 b. 13.69

Find the mean for the data items in the given frequency distribution. Round to the nearest hundredth, if necessary.

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

Score	Frequency
x	f
1	5
2	2
3	1
4	6
5	7
6	10
7	9
8	12
9	11
10	11

- A) 6.17                      B) 5.41                      C) 8.1                      D) 6.74

For the given data set, find the a. mean b. median c. mode (or state that there is no mode) d. midrange.

63) Ages of teachers in the mathematics department of a certain high school: 63) \_\_\_\_\_

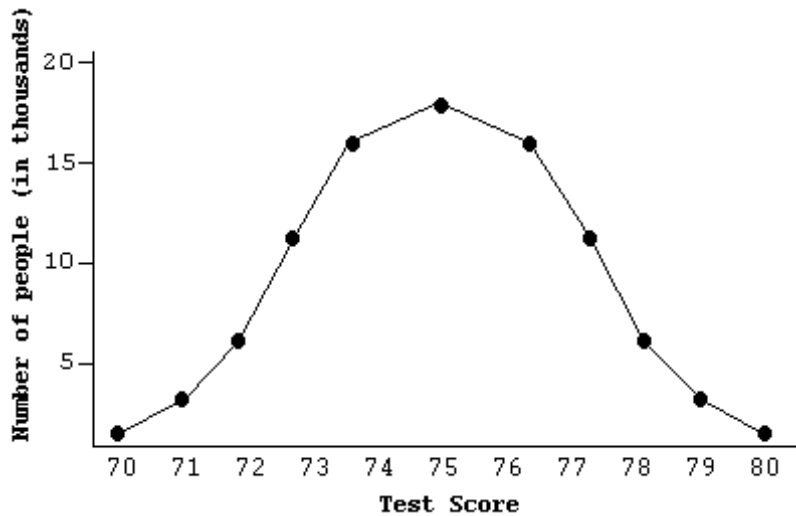
27, 53, 40, 60, 27, 53, 27, 50, 50, 41

- A) a. 27.1                      B) a. 42.8                      C) a. 32.1                      D) a. 42.8  
 b. 45.5                      b. 45.5                      b. 45.5                      b. 45.5  
 c. 27                      c. 27                      c. 27                      c. 50  
 d. 43.5                      d. 43.5                      d. 43.5                      d. 43.5

Solve the problem.

64) The frequency polygon below shows a distribution of test scores.

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

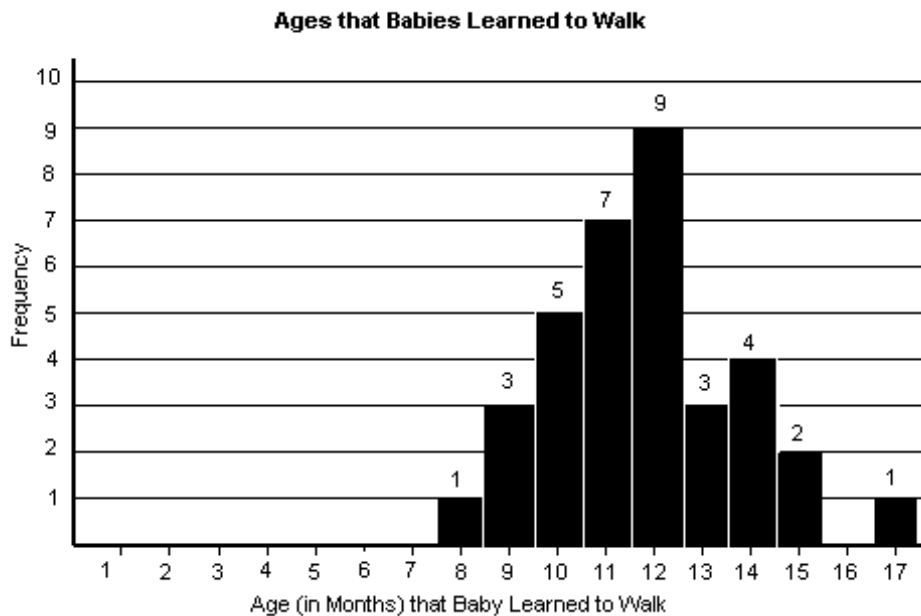


Which one of the following is true based on the graph?

- A) More people had a score of 75 than any other, and as the deviation from 75 increases or decreases, the scores fall off in a symmetrical manner.
- B) The percent of scores above any given score is equal to the percent of scores below that score.
- C) More people had a score of 77 than a score of 73.
- D) The graph is based on a sample of approximately 15 thousand people.

65) The histogram shows the ages (in months) that babies learned to walk. Use this histogram to solve the problem.

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



- (i) Find the median age that a baby learned to walk.
  - (ii) Find the third quartile by determining the median of the upper half of the data.
- A) (i) median = 12;  
(ii) third quartile = 13
  - B) (i) median = 11;  
(ii) first quartile = 12
  - C) (i) median = 11.5;  
(ii) first quartile = 12.5
  - D) (i) median = 12.5;  
(ii) first quartile = 13

Suppose that prices of a certain model of new homes are normally distributed with a mean of \$150,000. Use the 68-95-99.7 rule to find the percentage of buyers who paid:

- 66) less than \$145,600 if the standard deviation is \$2200. 66) \_\_\_\_\_  
A) 97.5%                      B) 47.5%                      C) 2.5%                      D) 95%

Test scores are normally distributed with a mean of 500. Convert the given score to a z-score, using the given standard deviation. Then find the percentage of students who score:

- 67) below 695 if the standard deviation is 130. 67) \_\_\_\_\_  
A) 56.68%                      B) 6.68%                      C) 93.32%                      D) 130%

The correlation coefficient,  $r$  is given for a sample of  $n$  data points. Use the  $\alpha = 0.05$  column in a correlation significance table to determine whether or not we may conclude that a correlation does exist in the population.

- 68)  $n = 47$   $r = -0.395$  68) \_\_\_\_\_  
A) No, we may not conclude that there is a correlation.  
B) Yes, we may conclude that there is a correlation.

Use the table of z-scores and percentiles to find the percentage of data items in a normal distribution that lie a. above and b. below the given score.

- 69)  $z = -0.4$  69) \_\_\_\_\_  
A) 0%, 100%                      B) 65.54%, 34.46%                      C) 34.46%, 65.54%                      D) 34.46%, 34.46%

- 70) Six people from different occupations were interviewed for a survey, and their annual salaries were as follows: \$12,000, \$20,000, \$25,000, \$37,000, \$67,500 and \$125,000. What is the mean annual salary for the six people? 70) \_\_\_\_\_  
A) \$47,750                      B) \$125,000                      C) \$35,000                      D) \$31,000