

CONTESTANT NUMBER:

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Score Test Below:

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_____ out of 250. Initials _____



**University Interscholastic League
A+ Mathematics Contest • Answer Sheet**

Write your contestant number in the upper right corner, and circle your grade below.

Circle Grade Level:

6 7 8

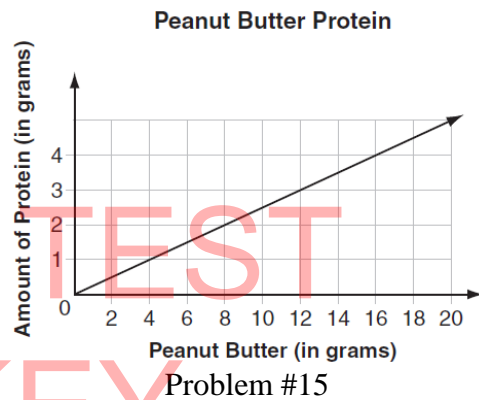
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- (12) A large bag of cement weighs 80 pounds. The bag weighs 2 pounds less than the weight of 3 small boxes of cement. Which equation can be used to find the weight, w , in pounds, of each small box of cement?
- A) $2 - 3w = 80$
 B) $3 - 2w = 80$
 C) $2w - 3 = 80$
 D) $3w - 2 = 80$
 E) $3w + 2 = 80$

- (13) $5.858 \div 0.101 = ?$
- A) 58 B) 0.58 C) 5.8 D) 580 E) 0.058

- (14) What is the median of 12, 15, 10, 18, 10, 20?
- A) 10 B) 11 C) $13 \frac{1}{2}$ D) 16 E) $16 \frac{1}{4}$

- (15) Looking at the graph to the right, how many grams of protein are in each gram of peanut butter?



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

- (16) A mathematics game uses a set of 44 cards. There are 4 cards for each of the numerals 0–9 and 4 wild cards. If the cards are shuffled, what is the probability that the top card is a wild card?

- A) $\frac{1}{4}$ B) $\frac{1}{44}$ C) $\frac{1}{22}$ D) $\frac{1}{11}$ E) $\frac{1}{14}$

- (17) Which mixed number is equivalent to 1.375?

- A) $1 \frac{5}{16}$ B) $1 \frac{3}{8}$ C) $1 \frac{3}{16}$ D) $1 \frac{3}{4}$ E) $1 \frac{5}{8}$

- (18) Mackenzie makes a necklace using the pattern of 2 red beads followed by 3 blue beads. She uses a total of 75 beads for the necklace. How many red beads does Mackenzie use?

- A) 25 B) 30 C) 35 D) 45 E) 50

- (19) Aaron’s goal is to read an average (mean) of 26 pages per day for 6 days. During the first 5 days he read 23 pages per day. How many pages must he read on the 6th day to reach his goal?

- A) 19 B) 21 C) 26 D) 29 E) 41

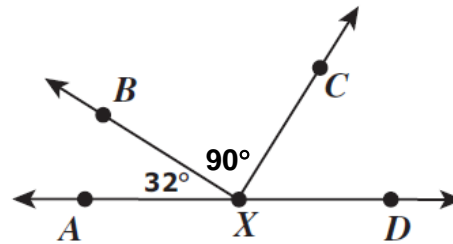
- (20) The running shoes Genny bought at a 20%-off sale were originally priced at \$70. Before tax was added, how much money did Genny save by buying the shoes on sale?

- A) \$7 B) \$10 C) \$14 D) \$15 E) \$16

- (21) If the leg of a right triangle is 12 inches (in.) and its hypotenuse is 13 in., what is the length of the other leg?
 A) 5 in. B) 10 in. C) 15 in. D) 25 in. E) 35 in.

- (22) In the figure to the right what is the measure $\angle CXD$?

- A) 58°
 B) 122°
 C) 22°
 D) 48°
 E) 88°



Problem #22

- (23) The profit, P , a school makes selling x tickets to a play can be determined by the formula $P = 8x - 400$. If the school made a profit of \$1200 on the play, how many tickets were sold?
 A) 75 B) 100 C) 150 D) 200 E) 250

- (24) What is the sum of the smallest two perfect squares?

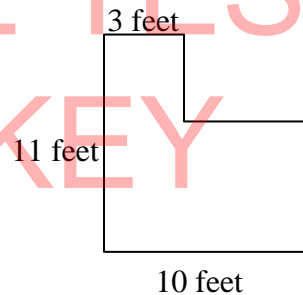
- A) 13 B) 25 C) 5 D) 10 E) 29

- (25) What is the product of the two smallest prime numbers?

- A) 6 B) 2 C) 3 D) 5 E) 15

- (26) What is the perimeter of the figure to the right?

- A) 22 feet
 B) 32 feet
 C) 36 feet
 D) 42 feet
 E) 48 feet



- (27) If a yardstick casts a shadow 10 feet long, how tall is a flagpole which casts a shadow 225 feet long at the same time?

- A) 67 ft. B) $67 \frac{1}{2}$ ft C) 68 ft. D) $68 \frac{1}{2}$ ft. E) 70 ft.

- (28) What is the sum of the numerator and denominator for the fractional equivalent of $0.82323232 \dots$?

- A) 122 B) 343 C) 361 D) 1031 E) 1805

- (29) When three different numbers from the set $\{-4, -3, -2, 4, 5\}$ are multiplied, what is the largest possible product?

- A) 24 B) 30 C) 32 D) 48 E) 60

- (30) If a water tank weighs 240 metric tons when 40% full and 300 metric tons when completely full, how many metric tons does it weigh when it is empty?

- A) 60 tons B) 100 tons C) 200 tons D) 300 tons E) 600 tons

- (31) In the sequence $\dots, a, b, c, d, 0, 1, 1, 2, 3, 5, 8, \dots$, each term is the sum of the two preceding terms. What is a ?

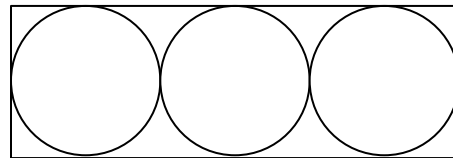
- A) -4 B) -3 C) -2 D) -1 E) 0

- (32) A person has \$2.75 in dimes and quarters. If she has 3 times as many dimes as quarters, how many coins does she have?
 A) 13 B) 16 C) 20 D) 22 E) 24

- (33) How many seconds longer is 2 percent of an hour than 30 percent of a minute?
 A) 6 sec. B) 45 sec. C) 48 sec. D) 54 sec. E) 60 sec.

- (34) The area of each circle shown to the right is 9π . What is the perimeter of the rectangle?

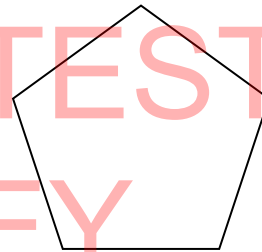
- A) 18
 B) 24
 C) 36
 D) 48
 E) 72



- (35) Martin correctly answered 90% of the questions on a math test that contained exactly 40 questions. How many of the questions did he answer incorrectly?
 A) 4 B) 8 C) 10 D) 12 E) 18

- (36) How many unique triangles are there in the regular pentagon to the right?

- A) 10
 B) 20
 C) 25
 D) 30
 E) 35



- (37) The number 519 is formed using the digits 5, 1 and 9. The three digits of this number are rearranged to form the largest possible and then the smallest possible three digit numbers. What is the difference between these largest and smallest numbers?

- A) 332 B) 432 C) 720 D) 756 E) 792

- (38) Liz picks four consecutive positive integers. She divides each integer by four, and then adds the remainders together. What is the sum of the remainders?

- A) 1 B) 2 C) 3 D) 4 E) 6

- (39) Laura took a 240 km trip to Salado. On her way there, her average speed was 120 km/h. She was stopped for speeding, so on her way home her average speed was 80 km/h. What was her average speed, in km/h, for the entire round-trip?

- A) 90 km/h B) 96 km/h C) 102 km/h D) 108 km/h E) 110 km/h

- (40) In a class of 30 students, exactly 7 have been to Mexico and exactly 11 have been to England. Of these students, 4 have been to both Mexico and England. How many students in this class have not been to Mexico or England?

- A) 12 B) 16 C) 18 D) 20 E) 23

- (41) Scott challenges Chris to a 100 m race. Scott runs 4 m for every 5 m that Chris runs. How far will Scott have run when Chris crosses the finish line?
 A) 20 m B) 75 m C) 76 m D) 80 m E) 96 m
- (42) Four percent of what number is the same as eight percent of 36?
 A) 18 B) 24 C) 72 D) 108 E) 216
- (43) How many prime numbers exist between 0 and 30?
 A) 8 B) 10 C) 11 D) 13 E) 14
- (44) $1101 \text{ base } 2 + 1011 \text{ base } 2 = \underline{\hspace{2cm}} \text{ base } 4$?
 A) 120 B) 2112 C) 110 D) 3123 E) 33
- (45) If $A = \{A, U, S, T, I, N\}$, and $B = \{S, T, A, T, E, S, M, A, N\}$ then what is the number of elements in $A \cup B$?
 A) 4 B) 7 C) 14 D) 15 E) None of these
- (46) If $12 - 4x < 20$, then
 A) $x > -2$ B) $x < 8$ C) $x < -2$ D) $x > 2$ E) $x < 2$
- (47) What is the sum of the positive integral divisors of 24?
 A) 60 B) 54 C) 49 D) 35 E) 34
- (48) What is the product of the multiplicative inverse and additive inverse of two-fifths?
 A) 1 B) 2.5 C) 0.4 D) -2.5 E) -1
- (49) What is the probability of picking a single card from a standard deck of 52 cards and drawing a face card?
 A) $\frac{1}{52}$ B) $\frac{3}{13}$ C) $\frac{2}{13}$ D) $\frac{1}{26}$ E) $\frac{4}{13}$
- (50) If $x^2 - y^2 = 12$ and $x + y = \frac{1}{2}$, then $x - y = ?$
 A) 6 B) $6\frac{1}{2}$ C) $8\frac{1}{2}$ D) 10 E) 24

2016 – 2017 University Interscholastic League JH/MS Mathematics Contest B – Key

- (1) C
- (2) B
- (3) C
- (4) A
- (5) D
- (6) D
- (7) E
- (8) B
- (9) C
- (10) B
- (11) C
- (12) D
- (13) A
- (14) C
- (15) A
- (16) D
- (17) B
- (18) B
- (19) E
- (20) C
- (21) A
- (22) A
- (23) D
- (24) C
- (25) A

- (26) D
- (27) B
- (28) C
- (29) E
- (30) C
- (31) B
- (32) C
- (33) D
- (34) D
- (35) A
- (36) A
- (37) E
- (38) E
- (39) B
- (40) B
- (41) D
- (42) C
- (43) B
- (44) C
- (45) E (8)
- (46) A
- (47) A
- (48) E
- (49) B
- (50) E

SAMPLE TEST
AND KEY