

2017

Problem 10 [\[edit\]](#)

A box contains five cards, numbered 1, 2, 3, 4, and 5. Three cards are selected randomly without replacement from the box. What is the probability that 4 is the largest value selected?

- (A) $\frac{1}{10}$ (B) $\frac{1}{5}$ (C) $\frac{3}{10}$ (D) $\frac{2}{5}$ (E) $\frac{1}{2}$

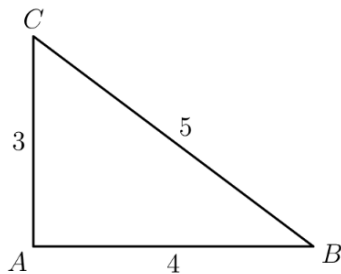
Problem 13 [\[edit\]](#)

Peter, Emma, and Kyler played chess with each other. Peter won 4 games and lost 2 games. Emma won 3 games and lost 3 games. If Kyler lost 3 games, how many games did he win?

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

Problem 16 [\[edit\]](#)

In the figure below, choose point D on \overline{BC} so that $\triangle ACD$ and $\triangle ABD$ have equal perimeters. What is the area of $\triangle ABD$?



- (A) $\frac{3}{4}$ (B) $\frac{3}{2}$ (C) 2 (D) $\frac{12}{5}$ (E) $\frac{5}{2}$

Problem 17 [\[edit\]](#)

Starting with some gold coins and some empty treasure chests, I tried to put 9 gold coins in each treasure chest, but that left 2 treasure chests empty. So instead I put 6 gold coins in each treasure chest, but then I had 3 gold coins left over. How many gold coins did I have?

- (A) 9 (B) 27 (C) 45 (D) 63 (E) 81

Problem 19 [\[edit\]](#)

For any positive integer M , the notation $M!$ denotes the product of the integers 1 through M . What is the largest integer n for which 5^n is a factor of the sum $98! + 99! + 100!$?

- (A) 23 (B) 24 (C) 25 (D) 26 (E) 27

- 8 On Monday Tye has \$2. Everyday he either gains \$3 or doubles the amount of money he had on the previous day. How many different dollar amounts could Tye have on Thursday, 3 days later?

(A) 3 (B) 4 (C) 5 (D) 6 (E) 7

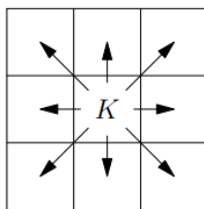
- 13 Buzz Bunny is hopping up and down a set of stairs, one step at a time. In how many ways can Buzz start on the ground, make a sequence of 6 hops, and end up back on the ground? (For example, one sequence of hops is up-up-down-down-up-down.)

(A) 4 (B) 5 (C) 6 (D) 8 (E) 12

- 16 Minh enters the numbers from 1 to 81 in a 9×9 grid in some order. She calculates the product of the numbers in each row and column. What is the least number of rows and columns that could have a product divisible by 3?

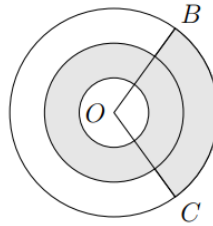
(A) 8 (B) 9 (C) 10 (D) 11 (E) 12

- 17 A chess king is said to "attack" all squares one step away from it (basically any square right next to it in any direction), horizontally, vertically, or diagonally. For instance, a king on the center square of a 3×3 grid attacks all 8 other squares, as shown below. Suppose a white king and a black king are placed on different squares of 3×3 grid so that they do not attack each other. In how many ways can this be done?



(A) 20 (B) 24 (C) 27 (D) 28 (E) 32

- 18 Three concentric circles centered at O have radii of 1, 2, and 3. Points B and C lie on the largest circle. The region between the two smaller circles is shaded, as is the portion of the region between the two larger circles bounded by central angle BOC , as shown in the figure below. Suppose the shaded and unshaded regions are equal in area. What is the measure of $\angle BOC$ in degrees?



- (A) 108 (B) 120 (C) 135 (D) 144 (E) 150
-

- 19** Jordan owns 15 pairs of sneakers. Three fifths of the pairs are red and the rest are white. Two thirds of the pairs are high-top and the rest are low-top. The red high-top sneakers make up a fraction of the collection. What is the least possible value of this fraction?

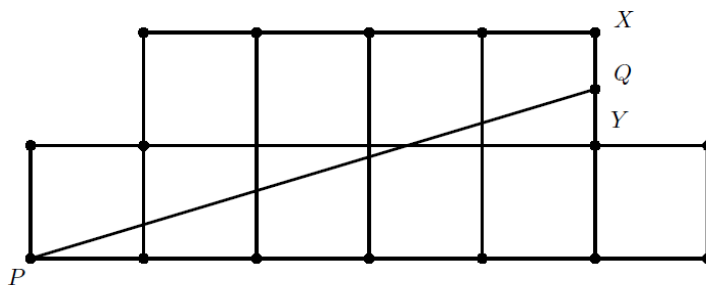
- (A) 0 (B) $\frac{1}{5}$ (C) $\frac{4}{15}$ (D) $\frac{1}{3}$ (E) $\frac{2}{5}$
-

Redo-2010

- 7 Using only pennies, nickels, dimes, and quarters, what is the smallest number of coins Freddie would need so he could pay any amount of money less than one dollar?

(A) 6 (B) 10 (C) 15 (D) 25 (E) 99

- 17 The diagram shows an octagon consisting of 10 unit squares. The portion below \overline{PQ} is a unit square and a triangle with base 5. If \overline{PQ} bisects the area of the octagon, what is the ratio $\frac{XQ}{QY}$?



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

Redo-2011

- 4 Here is a list of the numbers of fish that Tyler caught in nine outings last summer:

2, 0, 1, 3, 0, 3, 3, 1, 2.

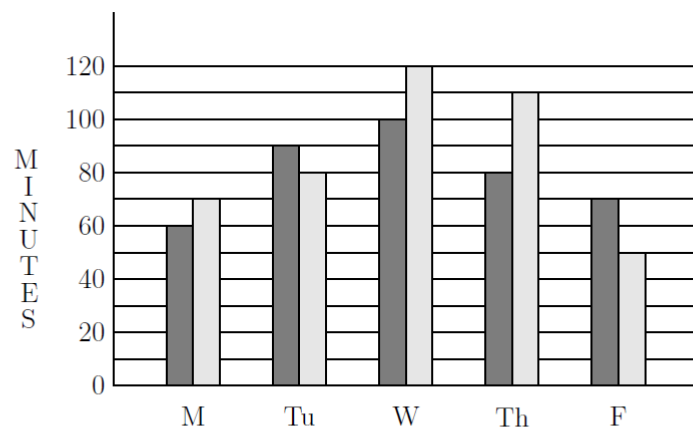
Which statement about the mean, median, and mode is true?

(A) median < mean < mode (B) mean < mode < median

(C) mean < median < mode (D) median < mode < mean

(E) mode < median < mean

- 11 The graph shows the number of minutes studied by both Asha (black bar) and Sasha (grey bar) in one week. On the average, how many more minutes per day did Sasha study than Asha?



- (A) 6 (B) 8 (C) 9 (D) 10 (E) 12

- 16** Let A be the area of the triangle with sides of length 25, 25, and 30. Let B be the area of the triangle with sides of length 25, 25, and 40. What is the relationship between A and B ?

- (A) $A = \frac{9}{16}B$ (B) $A = \frac{3}{4}B$ (C) $A = B$ (D) $A = \frac{4}{3}B$
 (E) $A = \frac{16}{9}B$

Redo 2015

- 5** Billy's basketball team scored the following points over the course of the first 11 games of the

season:

42, 47, 53, 53, 58, 58, 58, 61, 64, 65, 73

If his team scores 40 in the 12th game, which of the following statistics will show an increase?

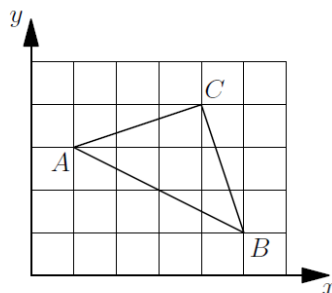
- (A) range (B) median (C) mean (D) mode (E) mid-range

- 17 Jeremy's father drives him to school in rush hour traffic in 20 minutes. One day there is no traffic, so his father can drive him 18 miles per hour faster and gets him to school in 12 minutes. How far in miles is it to school?

- (A) 4 (B) 6 (C) 8 (D) 9 (E) 12

- 19 A triangle with vertices as $A = (1, 3)$, $B = (5, 1)$, and $C = (4, 4)$ is plotted on a 6×5 grid. What fraction of the grid is covered by the triangle?

- (A) $\frac{1}{6}$ (B) $\frac{1}{5}$ (C) $\frac{1}{4}$ (D) $\frac{1}{3}$ (E) $\frac{1}{2}$



redo-2014

- 10 The first AMC 8 was given in 1985 and it has been given annually since that time. Samantha turned 12 years old the year that she took the seventh AMC 8. In what year was Samantha born?

- (A) 1979 (B) 1980 (C) 1981 (D) 1982 (E) 1983

- 12 A magazine printed photos of three celebrities along with three photos of the celebrities as babies. The baby pictures did not identify the celebrities. Readers were asked to match each celebrity with the correct baby pictures. What is the probability that a reader guessing at random will match all three correctly?

- (A) $\frac{1}{9}$ (B) $\frac{1}{6}$ (C) $\frac{1}{4}$ (D) $\frac{1}{3}$ (E) $\frac{1}{2}$

Redo-2013

- 8 A fair coin is tossed 3 times. What is the probability of at least two consecutive heads?

- (A) $\frac{1}{8}$ (B) $\frac{1}{4}$ (C) $\frac{3}{8}$ (D) $\frac{1}{2}$ (E) $\frac{3}{4}$

- 19 Bridget, Cassie, and Hannah are discussing the results of their last math test. Hannah shows Bridget and Cassie her test, but Bridget and Cassie don't show theirs to anyone. Cassie says, "I didn't get the lowest score in our class," and Bridget adds, "I didn't get the highest score." What is the ranking of the three girls from highest to lowest?
- (A) Hannah, Cassie, Bridget (B) Hannah, Bridget, Cassie
(C) Cassie, Bridget, Hannah (D) Cassie, Hannah, Bridget
(E) Bridget, Cassie, Hannah
-

Redo 2012

- 10 How many 4-digit numbers greater than 1000 are there that use the four digits of 2012?
(A) 6 (B) 7 (C) 8 (D) 9 (E) 12
-
- 17 A square with integer side length is cut into 10 squares, all of which have integer side length and at least 8 of which have area 1. What is the smallest possible value of the length of the side of the original square?
(A) 3 (B) 4 (C) 5 (D) 6 (E) 7
-
- 18 What is the smallest positive integer that is neither prime nor square and that has no prime factor less than 50?
(A) 3127 (B) 3133 (C) 3137 (D) 3139 (E) 3149
-

Redo-2009

- 16 How many 3-digit positive integers have digits whose product equals 24?
(A) 12 (B) 15 (C) 18 (D) 21 (E) 24
-

Redo-test2

10. How many 5-digit numbers greater than 10000 are there that use the five digits of 20123?
(A) 24 (B) 48 (C) 120 (D) 72 (E) 12
11. The mean, median, and unique mode of the positive integers 1, 5, 6, 7, 7, 9, x are all equal. What is the value of x ?
(A) 7 (B) 6 (C) 11 (D) 14 (E) 12

19. In a jar of red, green, and blue marbles, all but 16 are red marbles, all but 28 are green, and all but 34 are blue. How many marbles are in the jar?
(A) 26 (B) 28 (C) 39 (D) 40 (E) 5

Redo-test3

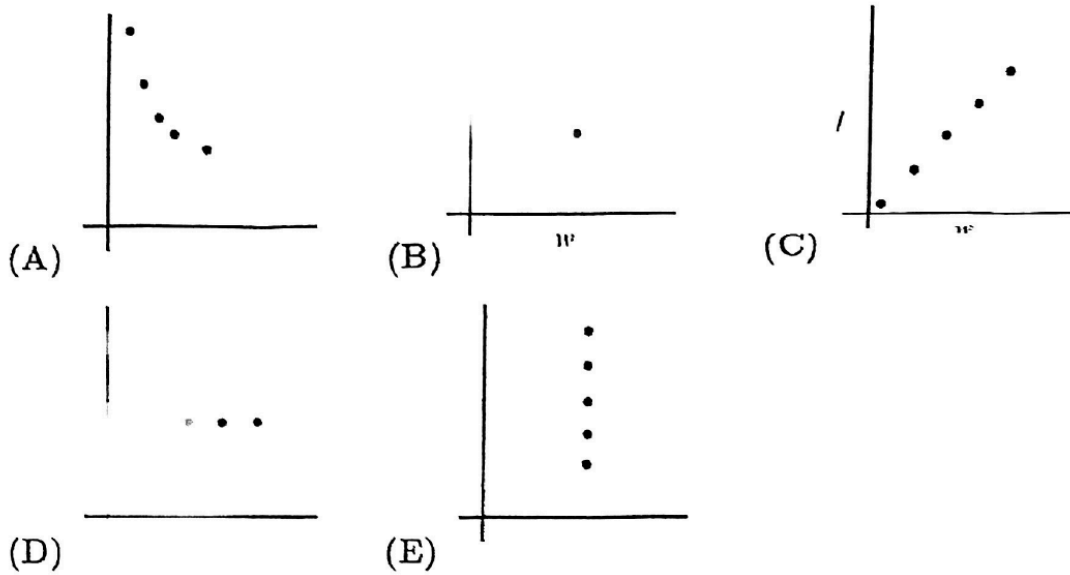
12. Of the 640 balls in a large bag, 85% are red and the rest are blue. How many of the red balls must be removed from the bag so that 75% of the remaining balls are red?
(A) 250 (B) 500 (C) 275 (D) 256 (E) 150

14. What is the sum of the prime factors of 2013?
(A) 674 (B) 77 (C) 75 (D) 67 (E) 201

15. A jar contains five different colors of gum drops: 25% are blue, 30% are brown, 3% are red, 17% are yellow and the other 40 gum drops are green. If half of brown gum drops are replaced by blue gum drops, how many of the gum drops will be blue?
(A) 35 (B) 36 (C) 64 (D) 48 (E) 68

Redo- test4

10. George's teacher asks him to plot all the ordered pairs (w, l) of positive integers for which w is the width and l is the length of a rectangle with area 36. What should his graph look like?
(A) A (B) B (C) C (D) D (E) E



11. How many three-digit numbers have digits whose sum is a perfect cube?
 (A) 13 (B) 26 (C) 36 (D) 38 (E) 39

12. Alex gets 90% on a 20-problem test, 95% on a 40-problem test and 96% on a 25-problem test. If the three tests are combined into one 85-problem test, which percent is closest to her overall score?
 (A) 20 (B) 92 (C) 93 (D) 94 (E) 95

Redo-test5

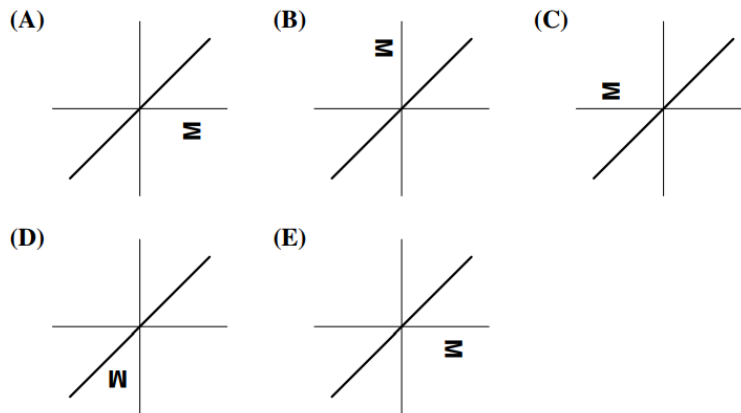
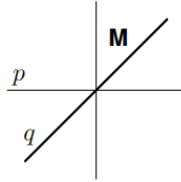
12. Nancy usually leaves her cell phone on. If her cell phone is on but she is not actually using it, the battery will last for 120 hours. If she is using it constantly, the battery will last for only 15 hours. Since the last recharge, her phone has been on 45 hours, and during that time she has used it for 240 minutes. If she doesn't talk any more but leaves the phone on, how many more hours will the battery last?
 (A) 57 (B) 47 (C) 120 (D) 37 (E) 43

2022

- 3 When three positive integers a , b , and c are multiplied together, their product is 100. Suppose $a < b < c$. In how many ways can the numbers be chosen?

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

- 4 The letter **M** in the figure below is first reflected over the line q and then reflected over the line p . What is the resulting image?



- 6 Three positive integers are equally spaced on a number line. The middle number is 15, and the largest number is 4 times the smallest number. What is the smallest of these three numbers?

(A) 4 (B) 5 (C) 6 (D) 7 (E) 8

- 12 The arrows on the two spinners shown below are spun. Let the number N equal 10 times the number on Spinner A , added to the number on Spinner B . What is the probability that N is a perfect square number?

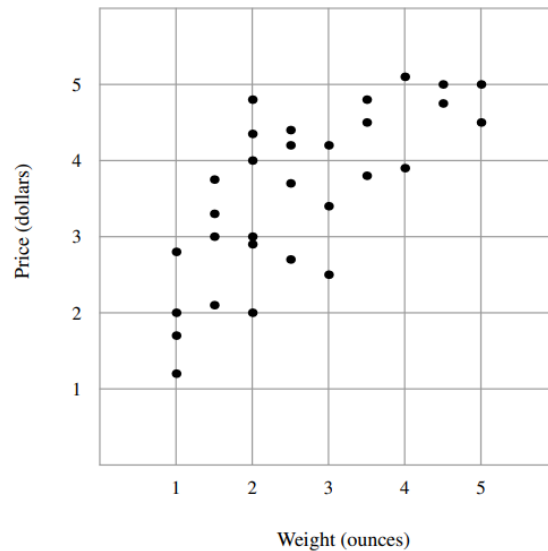
(A) $\frac{1}{16}$ (B) $\frac{1}{8}$ (C) $\frac{1}{4}$ (D) $\frac{3}{8}$ (E) $\frac{1}{2}$

-
- 13** How many positive integers can fill the blank in the sentence below?

"One positive integer is ___ more than twice another, and the sum of the two numbers is 28."

(A) 6 (B) 7 (C) 8 (D) 9 (E) 10

- 15** Laszlo went online to shop for black pepper and found thirty different black pepper options varying in weight and price, shown in the scatter plot below. In ounces, what is the weight of the pepper that offers the lowest price per ounce?



(A) 1 (B) 2 (C) 3 (D) 4 (E) 5

- 18** The midpoints of the four sides of a rectangle are $(-3, 0)$, $(2, 0)$, $(5, 4)$ and $(0, 4)$. What is the area of the rectangle?

(A) 20 (B) 25 (C) 40 (D) 50 (E) 80
