
Problem 1**1 point**

If $\frac{5^{-1} \cdot 5^5}{5^4} = 5^y$, which is the value of y ?

- a) 0 b) 1 c) 2 d) 3

Problem 2**1 point**

If pencils cost \$0.25 each, at most how many pencils can be purchased for n dollars, where n is an integer?

- a) $\frac{n}{25}$ b) $\frac{n}{4}$ c) $4n$ d) $\frac{25n}{4}$

Problem 3**1 point**

If x increased by 50 percent is equal to 20, then $x =$

- a) $\frac{40}{3}$ b) $\frac{20}{3}$ c) 10 d) $\frac{3}{4}$

Problem 4**1 point**

If $x=2y$ and $y=2z/3$, what is the value of z in terms of x ?

a) $\frac{2x}{3}$

b) $\frac{3x}{4}$

c) $\frac{4x}{3}$

d) $\frac{3x}{2}$

Problem 5**1 point**

If x is positive and $6-x^2 = \frac{15}{16}$, then $\sqrt{x} =$

a) $\frac{81}{6}$

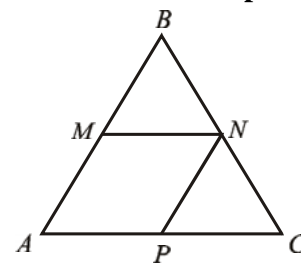
b) $\frac{9}{10}$

c) $\frac{3}{2}$

d) $\frac{2}{3}$

Problem 6**1 point**

In the figure M, N, P are midpoints ($AP=PC$, $CN=NB$, $AM=MB$) on the respective sides of equilateral triangle ABC ($AB=BC=AC$). If the perimeter of triangle ABC is 24, what is the perimeter of parallelogram AMNPQ?



a) 16

b) 32

c) 48

d) 64

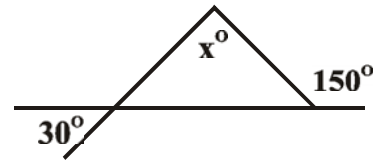
Problem 7**1 point**

If $3x=(x-2)(x+2)$, then x could be

- a) 2 b) 1 c) -1 d) -4

Problem 8**1 point**

In the figure right, $x=$



- a) 30 b) 80 c) 120 d) 130

Problem 9**1 point**

If the vertices of a triangle have rectangular coordinates $(0,0)$, $(8,0)$, and $(8,6)$, respectively, then the perimeter of the triangle is

- a) 10 b) 14 c) 24 d) 36

Problem 10**1 point**

Which of the following sums is greater than 1?

a) $\frac{1}{2} + \frac{1}{3}$

b) $\frac{7}{8} + \frac{3}{30}$

c) $\frac{15}{16} + \frac{2}{40}$

d) $\frac{35}{102} + \frac{2}{3}$

Problem 11**1 point**If $x=a^5$ and $y=a^6$, $a \neq 0$, which of the following is equivalent to a^{13} ?

a) xy

b) x^2y

c) x^3/y

d) y^3/x

Problem 12**1 point**If $\sqrt{7} < x < \sqrt{37}$ and x is an integer, then x can have how many different values?

a) Three

b) Four

c) Five

d) Eight

Problem 13**1 point**

The average (arithmetic mean) of five numbers is 88. Four of the numbers are 92, 89, 91, 84. What is the fifth number?

- a) 82 b) 84 c) 86 d) 89

Problem 14**1 point**

The measure of two angles of a parallelogram differ by 52 degrees. The number of degrees in the smaller angle is

- a) 38 b) 52 c) 64 d) 76

Problem 15**1 point**

For every positive integer n greater than 1, $n!$ (n factorial) is defined as the product of the first n positive integers. For example, $4! = 1 \cdot 2 \cdot 3 \cdot 4 = 24$.

What is the value of $\frac{12!}{10!}$?

- a) 2 b) 66 c) 121 d) 132

Problem 16**1 point**

Which of the following numbers is greatest?

- a) -0.125 b) -0.0125 c) -0.223 d) -0.0225

Problem 17**1 point**If $(x - 1)^2 = (x - 2)^2$, then $x =$

- a) $-\frac{5}{8}$ b) $\frac{2}{3}$ c) $\frac{3}{2}$ d) $\frac{5}{2}$

Problem 18**1 point**If m is an integer, for what value of m is $3^m < 100 < 3^{m+1}$?

- a) 1 b) 2 c) 3 d) 4

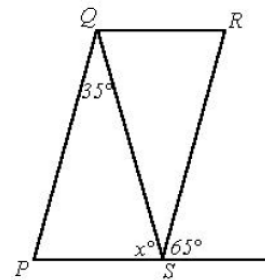
Problem 19**1 point**

If $xy \neq 0$, which of the following is equivalent to $\left(\frac{x}{y}\right)^2 \cdot \left(\frac{2y}{x}\right)^4$?

- a) $8xy^2$ b) $16x^2y^3$ c) $\frac{2y}{x}$ d) $\frac{16y^2}{x^2}$

Problem 20**1 point**

In the figure right, if $PQRS$ is a parallelogram, then $x =$



- a) 65 b) 75 c) 80 d) 100

Problem 21**2 points**

How many 3-digit integers, greater than 100 are there in which the sum of the digits equals 3?

- a) Four b) Six c) Nine d) Twelve

Problem 22**2 points**

If x is the sum of seven consecutive odd integers beginning with 3 and y is the sum of seven consecutive odd integers beginning with 5, then $y-x$ equals

- a) 7 b) 8 c) 12 d) 14

Problem 23**2 points**

If x is $11\frac{1}{9}$ percent more than y , then y is what percent less than x ?

- a) 9% b) 10% c) $11\frac{1}{9}\%$ d) $12\frac{1}{2}\%$

Problem 24**2 points**

The vertices of square S have coordinates $(-1,-2)$, $(-1,1)$, $(2,1)$, and $(2,-2)$, respectively. What are the coordinates of the point where the diagonals of S intersect?

- a) $\left(\frac{1}{2}, \frac{1}{2}\right)$ b) $\left(\frac{1}{2}, -\frac{1}{2}\right)$ c) $\left(\frac{3}{2}, \frac{1}{2}\right)$ d) $\left(-\frac{1}{2}, \frac{1}{2}\right)$

Problem 25**2 points**

Which of the following numbers is NOT the sum of three consecutive odd integers?

- a) 75 b) 123 c) 297 d) 313

Problem 26**2 points**

Which of the following pairs of numbers has an average (arithmetic mean) of 2?

- a) $2 - \sqrt{2}$ and $4 - \sqrt{2}$ b) $\frac{1}{0.5}$ and $\frac{2.4}{1.6}$ c) $\sqrt{5}$ and $\sqrt{3}$ d) $\frac{3}{2}$ and $\frac{5}{2}$

Problem 27**2 points**

If x is 1, 2, or 3 and y is either 2 or 4, then the product xy can have how many different possible values?

- a) Three b) Four c) Five d) Six

Problem 28**2 points**

If the radius of a circular region were decreased by 20 percent, the area of the circular region would decrease by what percent?

- a) 16% b) 20% c) 36% d) 44%

Problem 29**2 points**

If n^3 is 180 greater than n^2 , then $n =$

- a) 9 b) 8 c) 7 d) 6

Problem 30**2 points**

What percent of integers between 200 and 999, inclusive, end with digits “03”?

- a) 1% b) 2% c) 3% d) 4%

Problem 31**2 points**

If p and r are prime numbers, which of the following must also be prime?

- a) $p + r$ b) $pr + 1$ c) $p^2 + r^2$ d) none of above

Problem 32**2 points**

The average (arithmetic mean) number of students in 3 economics classes at a certain college is 24. If the total number of students in 2 of the classes combined is 38, how many students are in the remaining class?

- a) 19 b) 24 c) 31 d) 34

Problem 33**2 points**

The five numbers are ordered from least to greatest $3 < 7 < 9 < 14 < x$. If the average (arithmetic mean) is 2 greater than the median, what is the value of x ?

- a) 22 b) 20 c) 17 d) 16

Problem 34**2 points**

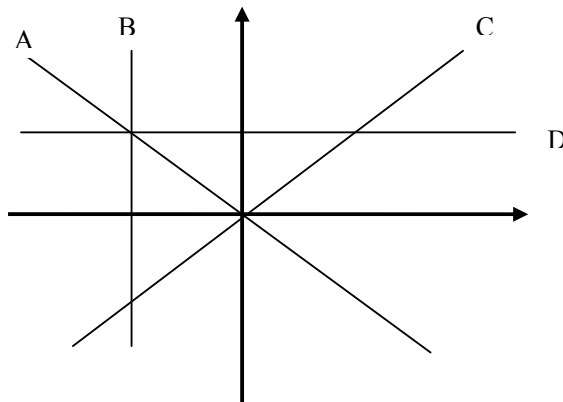
If $\frac{5^4 - 1}{n}$ is an integer and n is an integer, then n could be each of the following EXCEPT

- a) 6 b) 13 c) 25 d) 26

Problem 35**2 points**

For what point (x,y) on the graph of $y=0.5x-1$ does the x - coordinate equal the y -coordinate?

- a) $(-2,-2)$ b) $\left(\frac{1}{2}, \frac{1}{2}\right)$ c) $\left(1, -\frac{1}{2}\right)$ d) $(2, 2)$

Problem 36**2 points**

Which of the lines A, B, C, D in the figure above contains only points (x, y) with $x=y$?

- a) A b) B c) C d) D

Problem 37**2 points**

What is the least (smallest) integer value of n such that $\frac{1}{2^n} < 0.001$?

- a) 10 b) 11 c) 500 d) there is no such least value.

Problem 38**2 points**

If $a, b, c,$ and d are consecutive integers such that $a < b < c < d$, then in terms of a , the sum $a + b + d =$

- a) $a + 4$ b) $2a + 3$ c) $3a + 3$ d) $3a + 4$

Problem 39**2 points**

In a rectangular coordinate system, the set of all points (x, y) such that $-2 < x < 2$ and $-2 < y < 2$ is

- a) two perpendicular line segments b) two parallel line segments c) a square region d) a triangular region

Problem 40**2 points**

If $x + y = x$, what is the value of y ?

- a) -1 b) 0 c) 2 d) It cannot be determined from the information given.

Answer Keys

1	a
2	c
3	a
4	b
5	c
6	a
7	c
8	c
9	c
10	d
11	d
12	b
13	b
14	c
15	d
16	b
17	c
18	d
19	d
20	c
21	b
22	d
23	b
24	b
25	d
26	d
27	c
28	c
29	d
30	a
31	d
32	d
33	a
34	c
35	a
36	c
37	a
38	d
39	c
40	b