

Problem 1**1 point****List R:** 28, 23, 30, 25, 27,**List S:** 22, 19, 15, 17, 20The median of the numbers in list R is how much greater than the median of the numbers in list S ?

- a) 8 b) 10 c) 12 d) 13

Problem 2**1 point**Which of the following is a solution to $x + x^2 = 1$?

- a)
- -1
- b)
- 0
- c)
- 1
- d)
- non of them*

Problem 3**1 point**If $\frac{1}{2^m} + \frac{1}{2^m} = \frac{1}{2^x}$ then x expressed in terms of m is

- a)
- $m-1$
- b)
- $m+1$
- c)
- $2m$
- d)
- m^m

Problem 4**1 point**

If $x = 2y$ and $y = \frac{2z}{3}$ 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 $x > 0$ and $y > 0$, which of the following is equivalent to $\frac{x}{y} \sqrt{\frac{y}{x^2}}$?

- a) $\frac{\sqrt{x}}{\sqrt{y}}$ b) 1 c) $\frac{1}{\sqrt{y}}$ d) $\frac{1}{\sqrt{x}}$

Problem 6**1 point**

If $xy \neq 0$, $\frac{x-1}{xy} =$

- a) $\frac{1}{x} - \frac{1}{xy}$ b) $\frac{x}{y} - \frac{1}{xy}$ c) $\frac{1}{y} - x$ d) $\frac{1}{y} - \frac{1}{xy}$

Problem 7**1 point**

If $\frac{12}{7 - \frac{r}{s}} = 2$ which of the following must be true

- a) $r = 6$ b) $r = s$ c) $r = 2s$ d) $r = 3s$

Problem 8**2 point**

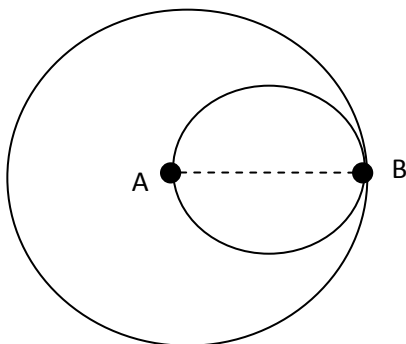
If $(x-1)^2 = (x-2)^2$ then $x =$

- a) $\frac{3}{2}$ b) $\frac{4}{3}$ c) $\frac{2}{3}$ d) $\frac{5}{2}$

Problem 9**2 point**

If x and y satisfy the system of equations $\begin{cases} 7x + 3y = 12 \\ 3x + 7y = 6 \end{cases}$, what is the value of $x - y$?

- a) $\frac{3}{2}$ b) $\frac{2}{3}$ c) 1 d) 4

Problem 10**1 point**

The circles shown are tangent at point B . Point A is the center of the larger circle, and line segment AB is a diameter of the smaller circle. The area of the smaller circle is what fraction of the area of the larger circle?

a) $\frac{1}{4}$

b) $\frac{1}{2}$

c) $\frac{1}{8}$

d) $\frac{1}{\pi}$

Problem 11**1 point**

A square is inscribed in a circle. If the circle has radius 4, what is the perimeter of the square?

a) $8\sqrt{2}$

b) $16\sqrt{2}$

c) $32\sqrt{2}$

d) 16

Problem 12**1 point**

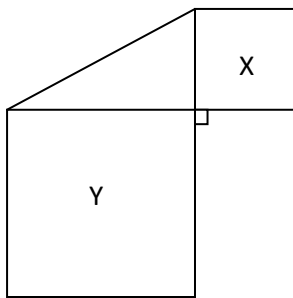
The measures of two angles of a parallelogram differ by 52 degrees. How many degrees is the smaller angle?

- a) 38 b) 64 c) 76 d) 128

Problem 13**1 point**

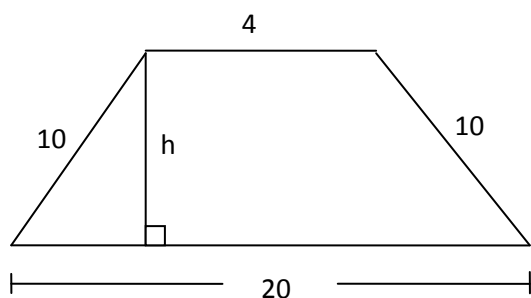
In the xy -plane, what is the slope of the line whose equation is $3x - 2y = 8$?

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

Problem 14**1 point**

In the figure above, the areas of square regions X and Y are 1 and 4 respectively. What is the area of triangular region?

- a) 2 b) 1 c) $\frac{1}{2}$ d) 0.25

Problem 15**1 point**

What is the value of h in the trapezoid above?

- a) $6\sqrt{2}$ b) $4\sqrt{3}$ c) 8 d) 6

Problem 16**1 point**

If two sides of a triangle have lengths 3.2 and 5.4, then the length of the third side must be between

- a) 0 and 2.2 b) 2.2 and 5.4 c) 2.2 and 8.6 d) 3.2 and 5.4

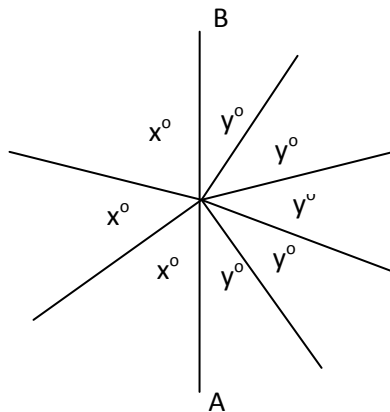
Problem 17**2 point**

In triangle ABC , the measure of angle A is 25° and the measure of angle B is greater than 90° . Which of the following could be the measure of angle C ?

- a) 115° b) 80° c) 70° d) 55°

Problem 18

2 point



In the figure above, AB is a line segment. What is the value of $\frac{x - y}{x + y}$?

- a) $\frac{25}{4}$
- b) $\frac{1}{4}$
- c) $\frac{7}{16}$
- d) $\frac{11}{24}$

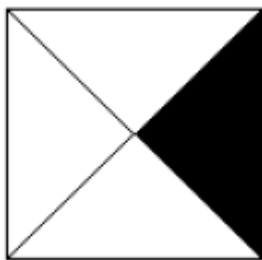
Problem 19

2 point



On the segment WZ above, if $WY = 21$, $XZ = 26$, and YZ is twice WX what is the value of XY ?

- a) 16
- b) 11
- c) 10
- d) 2

Problem 20**1 point**

If the area of the shaded region of the square above is 20, what is the perimeter of the square?

- a) $4\sqrt{5}$ b) $8\sqrt{5}$ c) $16\sqrt{5}$ d) 80

Problem 21**3 point**

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

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

Problem 22**1 point**

$$(\frac{1}{2} - \frac{1}{3}) + (\frac{1}{3} - \frac{1}{4}) + (\frac{1}{4} + \frac{1}{2}) =$$

- a) $\frac{1}{4}$ b) $\frac{1}{2}$ c) 1 d) $\frac{5}{4}$

Problem 23**1 point**

What is the least integer n such that $\frac{1}{2^n} < 0.001$?

- a) 500 b) 501 c) 10 d) 11

Problem 24**1 point**

If the sum of two positive integers is 43 and the difference of their squares is 43, then the smaller integer is

- a) 19 b) 20 c) 21 d) 22

Problem 25**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) $\frac{35}{102} + \frac{2}{3}$ d) $\frac{12}{25} + \frac{12}{30}$

Problem 26**1 point**

Of the following, which is the closest to $\ln 3$

- a) 3 b) e c) 1 d) 2.7

Problem 27**1 point**

If a is the smallest prime number greater than 21 and b is the largest prime number less than 16, then $ab =$

- a) 299 b) 323 c) 330 d) 345

Problem 28**1 point**

$$(19 - 18 - 17 - 16) - (20 - 19 - 18 - 17) =$$

- a) -36 b) -4 c) 1 d) 2

Problem 29**1 point**

The number 0.01 is how many times greater than $(0.0001)^2$?

- a) 10^4 b) 10^6 c) 10^8 d) 10^{10}

Problem 30**2 point**

If 720 is the product of the consecutive integers beginning with 2 and ending with n , what is the value of $n-1$?

- a) 5 b) 6 c) 8 d) 11

Problem 31**2 point**

$\frac{m}{-19}$ is an even integer. Which of the following must be true

- a) m is positive b) m is negative c) m is odd d) m is even

Problem 32**3 point**

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

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

Problem 33**2 point**

If $0 < xy < 1$, then which of the following can NOT be true?

- a) $x < 1$ and $y > 0$ b) $x < -1$ and $y < -1$ c) $x > 1$ and $y < 1$ d) $x > -1$ and $y < -1$

Problem 34**2 point**

If $0 < xy < 1$, then which of the following can be true?

- a) $x < -1$ and $y > 0$ b) $x < -1$ and $y < -1$ c) $x > 1$ and $y > 1$ d) $x > -1$ and $y < -1$

Problem 35**3 point**

How many positive 4-digit integers begin (on the left) with an odd digit and end with an even digit?

- a) 2500 b) 500 c) 250 d) 2000

Problem 36**2 point**

If j and k are integers and $j - k$ is even, which of the following must be even?

- a) k b) $jk + j$ c) jk d) $jk - 2j$

Problem 37**3 point**

If c and d are positive integers and m is the greatest common divisor of c and d , then m must be the greatest common divisor of c and which of the following integers?

- a) cd b) $2d$ c) $c + d$ d) d^2

Problem 38**1 point**

The average (arithmetic mean) of x and y is 20. If $z = 5$, what is the average of x , y , and z ?

a) $\frac{25}{3}$

b) $\frac{45}{2}$

c) 25

d) 15

Problem 39**1 point**

The average of k and $7k$ is 60. Then $k =$

a) 7.5

b) 8

c) 9.5

d) 15

Problem 40**3 point**

The average (arithmetic mean) of the 11 numbers in a list is 14. If the average of 9 of the numbers in the list is 8, what is the average of the other 2 numbers?

a) 73

b) 25

c) 44

d) 41