

KMF Math Sprint Practice -

Section 6 Medium

Question: 1

x and y are positive integers

$$x^2 + y^2 = 89$$

$$xy = 40$$

Quantity A

$$|x - y|$$

Quantity B

$$3$$

- ☐ Quantity A is greater.
- ☐ Quantity B is greater.
- ☐ The two quantities are equal.
- ☐ The relationship cannot be determined from the information given.

Question: 2

The average (arithmetic mean) of 20 numbers is 53. When one of the numbers is discarded, the average (arithmetic mean) of the remaining numbers is 54.

Quantity A

The discarded number

Quantity B

$$50$$

- ☐ Quantity A is greater.
- ☐ Quantity B is greater.
- ☐ The two quantities are equal.
- ☐ The relationship cannot be determined from the information given.

Question: 3

$d \neq 0$

Quantity A

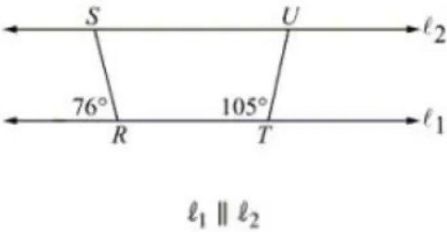
The area of a square region with sides of length d

Quantity B

The area of a circular region with diameter d

- ☐ Quantity A is greater.
- ☐ Quantity B is greater.
- ☐ The two quantities are equal.
- ☐ The relationship cannot be determined from the information given.

Question: 4



Quantity A

RS

Quantity B

TU

- ☐ Quantity A is greater.
- ☐ Quantity B is greater.
- ☐ The two quantities are equal.
- ☐ The relationship cannot be determined from the information given.

Question: 5

a is a positive integer.

x is the remainder when $15a$ is divided by 6

Quantity A

x

Quantity B

2

Question: 6

When testing a series of bottles of water, chemical A is found in 52% of all bottles, chemical B is found in 18% of all bottles, while chemical A and B are found in 10% of all bottles.

Quantity A

The proportion of bottles that contain neither chemical A nor chemical B

Quantity B

34%

- ☐ Quantity A is greater.
- ☐ Quantity B is greater.
- ☐ The two quantities are equal.
- ☐ The relationship cannot be determined from the information given.

Question: 7

$$5(x-y+20)=y+100$$

$$y \neq 0$$

Quantity A

$$\frac{x}{y}$$

Quantity B

$$1$$

- ☐ Quantity A is greater.
- ☐ Quantity B is greater.
- ☐ The two quantities are equal.
- ☐ The relationship cannot be determined from the information given.

Question: 8

n is a negative integer, and $ab=1$

Quantity A

$$a^n$$

Quantity B

$$b^n$$

Question: 9

If k , n and p are consecutive positive even integers and $k < n < p$, which of the following must be an integer?

☐ $\frac{k+n+p}{4}$

☐ $\frac{k+n+p}{6}$

☐ $\frac{k+n+p}{9}$

☐ $\frac{k+n+p}{10}$

☐ $\frac{k+n+p}{15}$

Question: 10

In a certain club, 40 percent of the members are less than 25 years old and 66 percent of the members are less than 35 years old. Approximately what fraction of the members of the club are at least 25 years old but less than 35 years old?

☐ $\frac{1}{2}$

☐ $\frac{1}{3}$

☐ $\frac{1}{4}$

☐ $\frac{1}{5}$

☐ $\frac{1}{6}$

Question: 11

On a trip, Marie drove the first half of the distance at an average speed of 30 miles per hour for a total of 13 hours of driving, and Juanita will drive the second half of the trip. They scheduled t hours driving for the entire distance. If they are to arrive exactly on schedule, at what average speed must Juanita drive the second half of the distance?

☐ $\frac{t-13}{(30)(13)}$

☐ $\frac{(t-13)(13)}{30}$

☐ $\frac{(t-13)(30)}{13}$

☐ $\frac{(30)(13)}{t-13}$

☐ $\frac{30}{(13)(t-13)}$

Question: 12

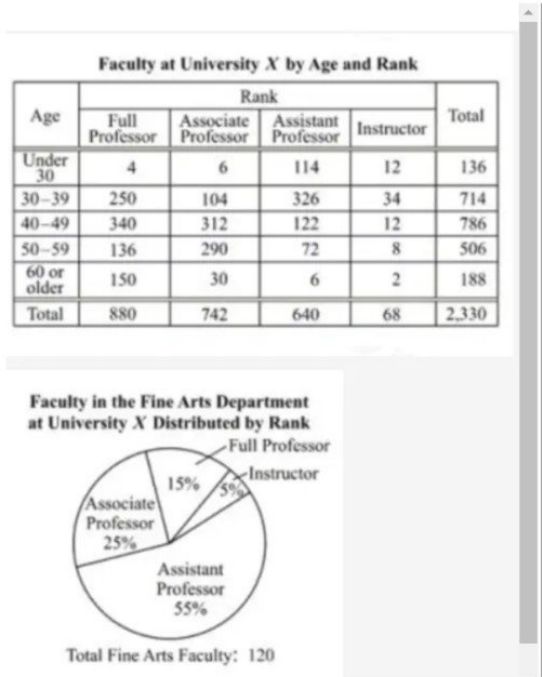
In the rectangular coordinate system, a certain line has slope 3. Which of the following pairs of points could be on the line?

- ☐ (-1, 2) and (-2, 5)
- ☐ (0, 1) and (3, 2)
- ☐ (0, 1) and (3, 4)
- ☐ (3, 1) and (4, 4)
- ☐ (3, 1) and (5, 6)

Question: 13

As a part of an environmental study of a river, a random sample of trout was drawn from the river and the lengths of the trout were recorded. The average (arithmetic mean) length was 14.31 inches. If a length of 16.89 inches was 1.50 standard deviations above the average, what was the standard deviation of the lengths of the trout in the sample?

Question: 14



For which of the age-groups is the ratio of the number of full professors to the number of associate professors the greatest?

- ☐ Under 30
- ☐ 30–39
- ☐ 40–49
- ☐ 50–59
- ☐ 60 or older

Question: 15

Faculty at University X by Age and Rank					
Age	Rank				Total
	Full Professor	Associate Professor	Assistant Professor	Instructor	
Under 30	4	6	114	12	136
30–39	250	104	326	34	714
40–49	340	312	122	12	786
50–59	136	290	72	8	506
60 or older	150	30	6	2	188
Total	880	742	640	68	2,330

Faculty in the Fine Arts Department at University X Distributed by Rank



Total Fine Arts Faculty: 120

If 10 percent of all the faculty members under 40 at University X are in the fine arts department, approximately what percent of the faculty members in the fine arts department are under 40?

- ☐ 75%
- ☐ 70%
- ☐ 60%
- ☐ 45%
- ☐ 30%

Question: 16

Faculty at University X by Age and Rank					
Age	Rank				Total
	Full Professor	Associate Professor	Assistant Professor	Instructor	
Under 30	4	6	114	12	136
30–39	250	104	326	34	714
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50–59	136	290	72	8	506
60 or older	150	30	6	2	188
Total	880	742	640	68	2,330

Faculty in the Fine Arts Department at University X Distributed by Rank



Total Fine Arts Faculty: 120

How many faculty members at University X are either associate professors or at least 60 years old or both?

- ☐ 1050
- ☐ 980
- ☐ 930
- ☐ 900
- ☐ 870

Question: 17

The units digit of 7^{34} is x , and the units digit of 6^{34} is y . What is the value of the product xy ?

Question: 18

$$y < x$$

$$y = rs$$

$$z = rxy$$

If r , s , x , y and z are positive even integers that are related by the system shown, what is the median of the integers r , s , x , y and z ?

☐ r

☐ s

☐ x

☐ y

☐ z

Question: 19

If an equilateral triangle with sides of length 20 has an altitude of length $20x$, then $x = ?$

☐ $\frac{1}{2}$

☐ $\frac{\sqrt{3}}{2}$

☐ 1

☐ $\sqrt{2}$

☐ $2\sqrt{3}$

Question: 20

Mr. Thomas gave a chemistry test to 25 students and assigned each student a score. Of the 25 students, 12 students received scores that were greater than 80.

Which of the following statements individually provide(s) sufficient additional information to determine the median of the 25 scores?

Indicate all such statements.

☐ The average (arithmetic mean) of the 25 scores was 80

☐ One student received a score of 80

☐ Twelve students received scores that were less than or equal to 75