

3 Calculator NOT allowed

Math Test – No Calculator

25 MINUTES, 20 QUESTIONS

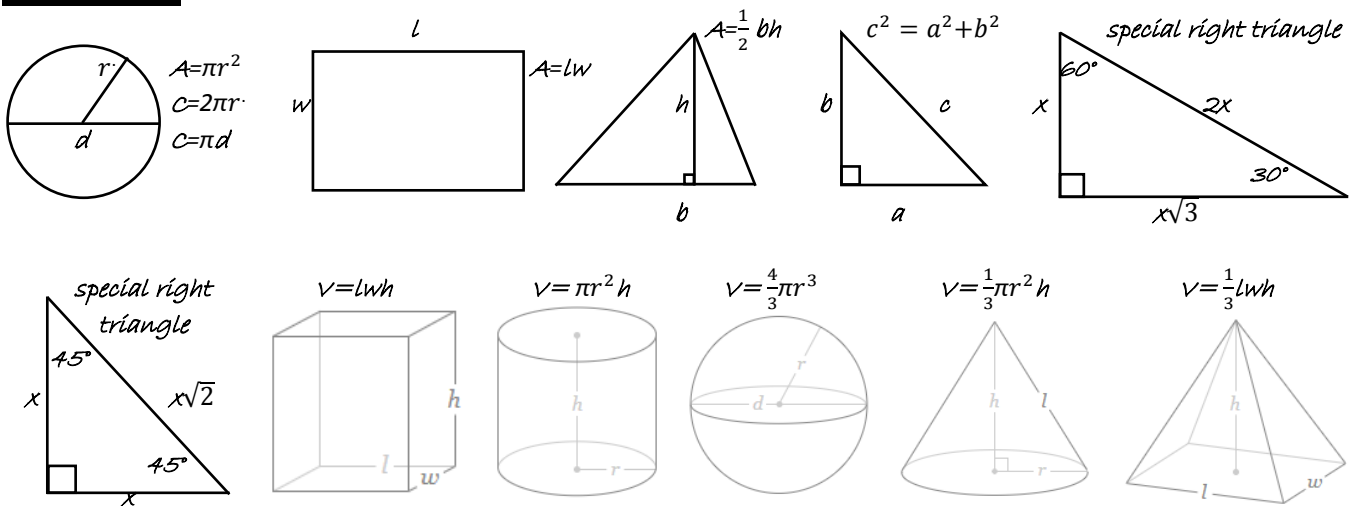
DIRECTIONS

For each question 1-15, given below, solve each question, and choose the best answer from the multiple choices given and completely fill in the appropriate bubble. Answers to questions 16-20 have to be entered in the grid. Please follow directions given before question number 16 to enter answers by properly filling in the bubbles in the grid. Any space available on the question paper may be used for scratch work.

NOTES

- 1) Calculator is not allowed in this section.
- 2) All coefficients, variables and other expressions are real numbers unless stated otherwise.
- 3) All figures shown in the test are to scale unless stated otherwise.
- 4) Unless stated otherwise, all figures lie in a two dimensional plane.
- 5) Unless stated otherwise, the domain of any function " $f(x)$ " and variable " x " are all real numbers.

REFERENCES



There are 360 degrees in a circle.
There are 2π radians in a circle.
The sum of inside angles of a triangle is 180 degrees.

3 Calculator NOT allowed

1

If $\frac{y-2}{5} = m$ and if $m = 4$, find the value of y .

- A) $7m$
- B) $5m$
- C) $5m+2$
- D) $5m-2$

2

If $i = \sqrt{-1}$ find the sum of $(8 + 4i) - (-9 + 10i)$.
changed, covering the same topic as pg331-q02

- A) $-1 + 16i$
- B) $-1 - 6i$
- C) $17 + 16i$
- D) $17 - 6i$

3

The day after Halloween, John ate r candies per hour for 7 hours and Jim ate s candies per hour for 8 hours. From the choices below, which of the following is the correct answer for the total number of candies eaten by John and Jim on the day after Halloween?

- A) $15rs$
- B) $56rs$
- C) $7r + 8s$
- D) $8r + 7s$

4

A delivery person for a courier company, drives a certain number of miles each 5 day work week. At the end of each weekday, the approximate remaining number of miles that the driver still needs to drive for that week can be guesstimated from the equation below.

$$M = 1025 - 205n$$

where, M = number of miles left to be driven that week;
 n = number of work days, the delivery person has worked so far this week.

What does 1025 mean in the above equation?

The delivery person drives approximately

- A) 1025 miles per day.
- B) 1025 miles per week.
- C) 205 miles per week.
- D) 1025 miles per month.

3 Calculator NOT allowed

5

Simplify $(3a^2b - 5b^2 - 7ab^2) - (4a^2b - 9ab^2 - 5b^2)$

- A) $5a^2b^2$
- B) $-a^2b + 2ab^2$
- C) $7a^2b + 16ab^2$
- D) $7a^2b + 16ab^2 + 10b^2$

6

A veterinarian uses the equation $w = 5w + 7$ to estimate a dachshund's weight in ounces between the ages 4 weeks to 26 weeks.

Approximately how much weekly weight gain in ounces do dachshund's show from age 4 weeks to 26 weeks.

- A) 5
- B) 7
- C) 26
- D) 52

7

If $x = \left(\frac{1+(c+1)^p}{1+(c+1)^{p+1}}\right)y$

What is the value of "y"?

- A) $y = \left(\frac{1+(c+1)^p}{1+(c+1)^{p+1}}\right)x$
- B) $y = \left(\frac{1+(c+1)^{p+1}}{1+(c+1)^p}\right)x$
- C) $y = \left(\frac{1}{1+(c+1)^p}\right)x$
- D) $y = \left(\frac{1}{1+(c+1)^{p+1}}\right)x$

8

What is the value of $\frac{40q}{p}$ if $\frac{p}{q} = 20$?

- A) 0
- B) 2
- C) 20
- D) 800

3 Calculator NOT allowed

9

Solve the equations below to find the value of (x, y)

$$5x + 10y = 25$$

$$2y - 6x = 40$$

- A) $(-1, 5)$
- B) $(-5, 5)$
- C) $(-5, 4)$
- D) $(-5, 3)$

10

In the function

$$f(x) = bx^2 + 15, \quad \text{"b" is a constant.}$$

If $f(3) = 33$, find the value of $f(5)$.

- A) 65
- B) 70
- C) 75
- D) 80

11

In the local supermarket, the sale prices of radiant heaters and hot air blowers go down after December 31, till the inventory is sold out.

The sale prices are based on the following formula,

$$\text{sale price of Radiant Heater} = \$10 - \$0.75m,$$

$$\text{sale price of Hot Air Blower} = \$12 - \$1.25m,$$

where, m is the number of months after December 31.

How many months after December 31, were the prices of the two electrical appliances same?

What was the price of the Hot Air Blower then? _____

- A) after 4 months, the price of the Hot Air Blower was \$10
- B) after 6 months, the price of the Hot Air Blower was \$10
- C) after 6 months, the price of the Hot Air Blower was \$7
- D) after 4 months, the price of the Hot Air Blower was \$7

12

Which of the following points, is on the line

$$2y = 5x + 10;$$

- A) $(10, 0)$
- B) $(0, 2)$
- C) $(0, 3)$
- D) $(0, 5)$

3

Calculator NOT allowed

13

Find the value of $\frac{1}{\frac{1}{p+10} + \frac{1}{p+20}}$

A) $\frac{2p+30}{p^2+30p+200}$

B) $\frac{p^2+30p+200}{2p+30}$

C) $2p + 30$

D) $p^2 + 30p + 200$

14

Find the value of $\frac{16^a}{4^b}$; if $2a-b=16$

A) 2^{-8}

B) 2^8

C) 16^{-8}

D) 16^8

15

In the following expression,
 $pqx^2 + (-p+q)x - 1 = 10x^2 + 3x - 1$
 what values can q take?

A) -2 and 0

B) 2 and 0

C) 0 and 5

D) -2 and 5

3

Calculator NOT allowed

DIRECTIONS

For the questions 16-20, solve the questions and write the answers in the grid

A) You may want to write the answers above the bubbles to help you fill in the correct bubbles. Credit is given only for filling in the correct bubbles on the answer sheet.

B) Fill in only one bubble in each column.

C) You will not be penalized for a negative answer.

D) Some questions may have two or more correct answers. In that case fill in the bubble for only one correct answer.

E) If your answer is a MIXED NUMBER, such as $5\frac{1}{2}$, convert it to a decimal number, i.e. 5.5 or an improper fraction, i.e. $\frac{11}{2}$ and entered in to the grid as such. Do not enter it in the grid as 5 1/2. It will be taken as $\frac{51}{2}$

F) If your answer is a DECIMAL NUMBER with more digits than the number of columns in the grid, you must either round off or truncate the answer.

If answer = $11/2$

It can be entered in the grid in any of the two ways shown below.

	1	1	/	2			5	.	5
/	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	/	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If answer = $5/9$

It can be entered in the grid in any of the three ways shown below.

		5	/	9		.	5	5	5		.	5	5	6
/	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	/	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	/	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	5	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	5	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If answer = 301

It can be entered in the grid in any of the two ways shown below.

You can start entering the digits in any column. Leave unused columns blank.

		3	0	1			3	0	1	
/	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	/	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	0	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	3	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3

Calculator NOT allowed

16

Find the value of x
for $x^2 - 25 = 0$
and
 x has to be a positive number.

18

For the system of equations given below,
 $a + b = 10$
 $a + 3b = 24$
Find the value of " a ".

17

The length of shadow cast by a 5 feet tall vertical rod is 15 feet. The light source is a streetlamp. The streetlamp is 30 feet from the vertical rod. At what height is the lamp installed in the streetlamp.

3

Calculator NOT allowed

19

In a triangle, where one of the angles is 90° , one of the other two angles is α .

$$\text{If } \sin \alpha = \frac{8}{10}$$

What is the value of $\cos \alpha$?

20

Given that $p = 3\sqrt{7}$, $5p = 3q$ and $q = \frac{r}{2}$,
express "r" in terms of "p".

STOP

*If you finish before time is called, you may check your work on this section only.
Do not turn to any other section*

Math Test – Calculator

55 MINUTES, 38 QUESTIONS

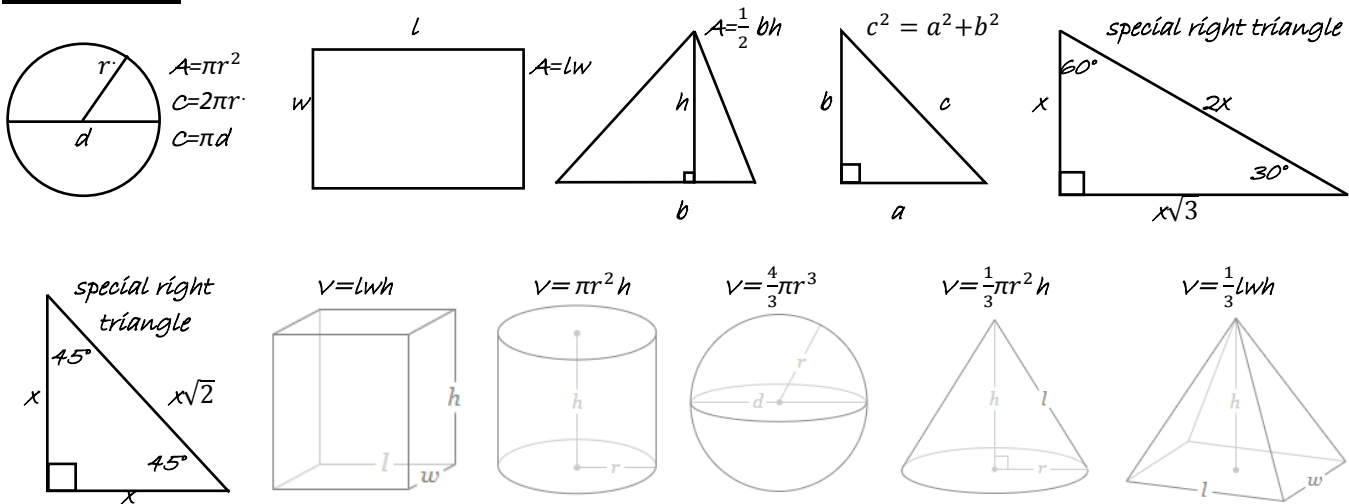
DIRECTIONS

For each question 1-30, given below, solve each question, and choose the best answer from the multiple choices given and completely fill in the appropriate bubble. Answers to questions 31-38 have to be entered in the grid. Please follow directions given before question number 31 to enter answers by properly filling in the bubbles in the grid. Any space available on the question paper may be used for scratch work.

NOTES

- 1) Calculator is allowed in this section.
- 2) All coefficients, variables and other expressions are real numbers unless stated otherwise.
- 3) All figures shown in the test are to scale unless stated otherwise.
- 4) Unless stated otherwise, all figures lie in two dimensional plane.
- 5) Unless stated otherwise, the domain of any function “ $f(x)$ ” and variable “ x ” are all real numbers.

REFERENCES

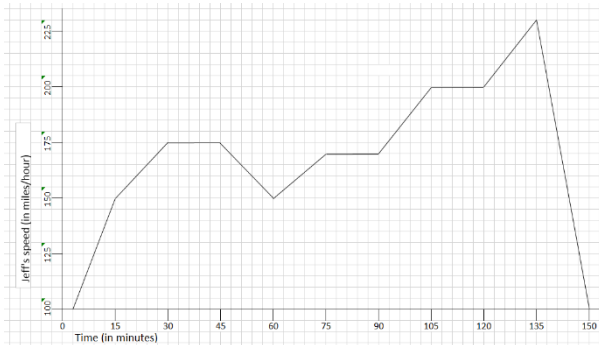


There are 360 degrees in a circle.
 There are 2π radians in a circle.
 The sum of inside angles of a triangle is 180 degrees.

4 Calculator is allowed

1

Jeff is training to be a highspeed train driver. The following graph represent his speeds, above 100 miles/hour, during a practice run. In which time frame is his speed constant for a while, then increases, and then decreases.



- A) from 120 minutes to 15 minutes
- B) from 105 minutes to 150 minutes
- C) from 90 minutes to 150 minutes
- D) from 75 minutes to 120 minutes

2

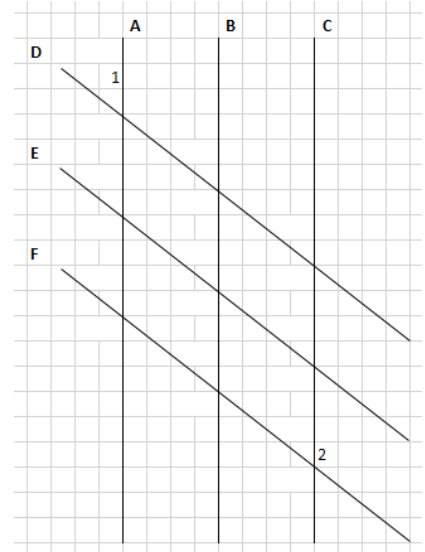
Given that "c" is a constant in the expression "p = cq".
If "p = 36" when "q = 12",
Find the value of "p", when "q = 10"?

- A) 10
- B) 20
- C) 30
- D) 40

3

In the figure below, lines A, B and C are parallel to each other. Lines D, E and F are also parallel to each other. Angle 1 has been defined to be 50° . What is the value of angle 2?

- A) 100°
- B) 110°
- C) 120°
- D) 130°



4

If " $6 + 14x$ ", is 25 more than 9, find the value of $5x$.

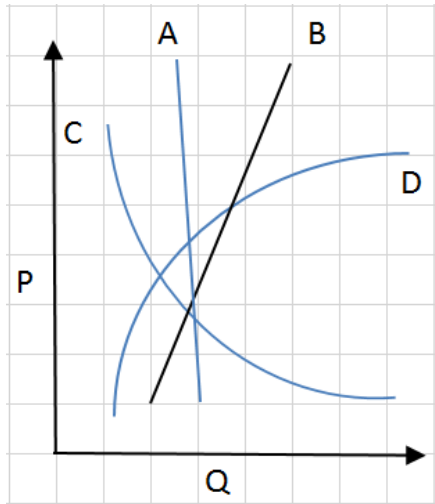
- A) 0
- B) 5
- C) 10
- D) 15

4 Calculator is allowed

5

Question: In the graph shown below, which line on the graph shows that as the rate of change of P decreases, the rate of change of Q increases? Also, as P decreases Q increases. _____

- A) A
- B) B
- C) C
- D) D.



6

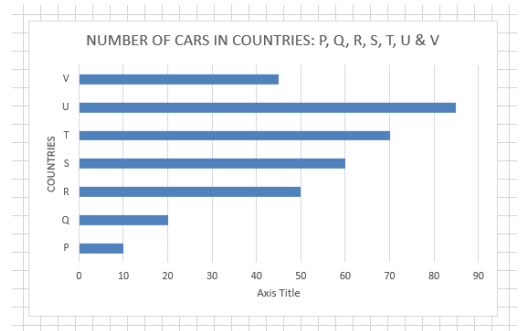
Given below are the relationship between centiliter, liter and kiloliter. How many centiliters are there in 1 kiloliter?

1 kiloliter = 1000 liters
 100 centiliters = 1 liter

- A) 100
- B) 1,000
- C) 10,000
- D) 100,000

7

For the seven countries listed below, the bars show the number of cars. If the total number of cars is 340 million, what should the words, "Axis Title" be replaced by, to accurately reflect the data on the graph.



- A) NUMBER OF CARS (in 10,000s)
- B) NUMBER OF CARS (in 100,000s)
- C) NUMBER OF CARS (in 1,000,000s)
- D) NUMBER OF CARS (in 10,000,000s)

8

For what value of x is $|x - 5| + 5 = 4$?

- A) -4
- B) 4
- C) -1
- D) The expression $|x - 5| + 5$ can never be equal to 4.

4 Calculator is allowed

9

The equation below represents a line on the xy coordinate plane. In the equation, “ m ” is the slope of the line and “ b ” is the intercept of the line on the y -axis.

$$y = mx + b$$

Which of the following is the correct representation of “ x ”?

- A) $\frac{y-b}{m}$
- B) $\frac{y-m}{b}$
- C) $\frac{b-y}{m}$
- D) $\frac{m-b}{y}$

10

The equation below represents a line on the xy coordinate plane.

$$2y = 10x + 6$$

For which value of “ x ” would “ y ” be equal to “29”?

- A) $\frac{5}{26}$
- B) $\frac{5}{16}$
- C) $\frac{16}{5}$
- D) $\frac{26}{5}$

11

Question: For the given inequality

$$10x - 5 \geq 8x - 7$$

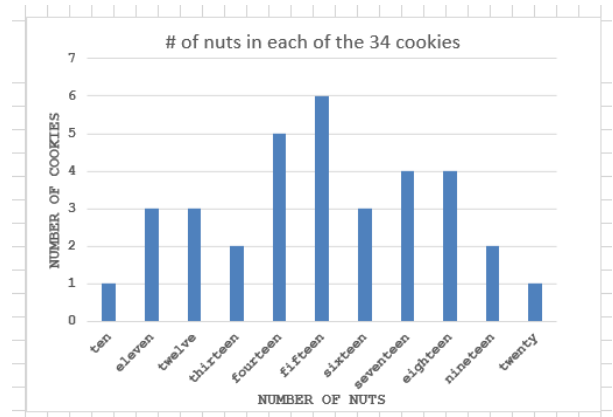
which of the following choices is NOT the correct answer.

- A) -2
- B) -1
- C) 0
- D) 1

12

Based on the graph below, find the approximate average number of “nuts” per cookie?

- A) 13
- B) 14
- C) 15
- D) 16



4 Calculator is allowed

13

Use the production data for a plastic manufacturing company in the table below to answer this question. Which cup's production is about 12% of the shift's total production?

Items produced on different shifts				
	Shift 1	Shift 2	Shift 3	Total
Red cups	1616	1568	1552	4736
Blue cups	1232	768	752	2304
Green cups	368	896	816	2688
Total	3216	3232	3280	9728

- A) Red cups on Shift 1
- B) Green cups on Shift 1
- C) Blue cups on Shift 2
- D) Green cups on Shift 3

14

The table shown below lists the weight of seeds in grams. The reading 0.950 is a mistake. If that data point is removed from the data set, which of the following choices will see the maximum change in its value?

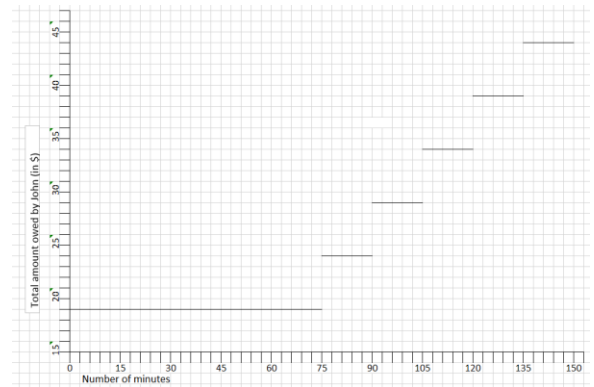
- A) mean
- B) mode
- C) median
- D) range

Weight of seeds
0.950
0.989
0.990
0.990
0.991
0.991
0.991
0.992
0.992
0.992
0.993
0.993
0.994
0.994
0.995

15

A hardware store lets customers rent a truck and charges them \$19 for the first 75 minutes and \$5 for each partial or full set of 15 minutes afterwards. If John rented the truck and returned it after 122 minutes, how much does he owe the hardware store? If a customer returns a truck after exactly 75 minutes or 90 minutes or so on, they will be charged at the lower line rate.

- A) \$39
- B) \$34
- C) \$29
- D) \$24



16

Which choice below comes closest to representing the graph in the previous question?

- A) total owed by john to the hardware store = $\$5 + \left\{ \left(\frac{\text{Roundup}(\text{time in minutes} - 75)}{15} \right) \right\} \times \19
- B) total owed by john to the hardware store = $\$19 + \left\{ \left(\frac{\text{Roundup}(\text{time in minutes} - 75)}{15} \right) \right\} \times \5
- C) total owed by john to the hardware store = $\$5 + \left\{ \left(\frac{15}{\text{Roundup}(\text{time in minutes} - 75)} \right) \right\} \times \19
- D) total owed by john to the hardware store = $\$19 + \left\{ \left(\frac{15}{\text{Roundup}(\text{time in minutes} - 75)} \right) \right\} \times \5

Where,
Roundup = Rounds up time to the next multiple of 15

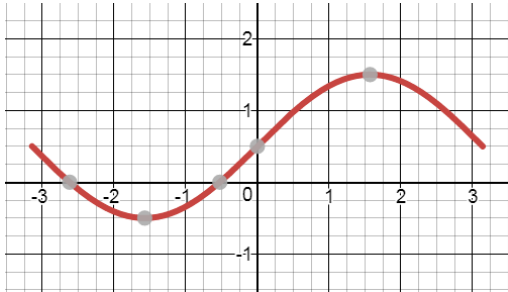
4

Calculator is allowed

17

For the graph shown below,
what are the values of x for $y=0$?

- A) 0.50 and 1.50
- B) -0.52 and -2.62
- C) -0.50 and 1.50
- D) 0.00 and -1.57



18

The following two inequalities are lines in the xy coordinate system.

$$5y - p < -2x$$

$$5y - q > 2x$$

$(0, 0.2)$ satisfies both inequalities above.

Which of the following choices is always true?

- A) $1 < p$
- B) $1 < q$
- C) $5 < p$
- D) $5 < q$

19

Julie has set up a lemonade stand and is selling lemonade at 99 cents each and cookies at 49 cents each, to collect money for a good cause. On her first day, she sold a total of 150 cups of lemonade and cookies and collected \$123.50. How many cups of lemonade did she sell on her first day?

- A) 90
- B) 100
- C) 110
- D) 120

20

Julie bought a dress at a sale. The sale resulted in a 40 percent discount off the original price. The total amount charged to her credit card was " d " dollars. It included a 7% sales tax on the sale price (i.e. the price after the 30% discount). Which of the choices given below is the original price of the dress in terms of " d ".

- A) $0.60d$
- B) $\frac{d}{0.60}$
- C) $\frac{1.07 \times 0.60}{d}$
- D) $\frac{d}{1.07 \times 0.60}$

4 Calculator is allowed

21

The state university conducted a research on correlation between memory loss and sleep inducing medicine. If a random selection is made from among all the people who were interviewed for this research, what is the probability that the person remembered between 6 to 10 jokes? Group "A" represented people who had not taken any sleep inducing medicine. Group "B" represented people who had taken a dose of sleep inducing medicine within one hour of the start of the interview. Please see the table below for details.

Research on correlation between "memory loss" and "a dose of sleep inducing medicine"					
	Total # of people in each category	Jokes remembered during interview with a researcher			
		zero	1 to 5 jokes	6 to 10 jokes	11 or more jokes
Group "A". (no medicine)	39	10	15	9	5
Group "B". (a dose of sleep inducing medicine within one hour of the start of interview)	39	19	12	6	2
Total	78	29	27	15	7

- A) $\frac{9}{15}$
- B) $\frac{78}{15}$
- C) $\frac{15}{78}$
- D) $\frac{6}{15}$

For Questions 22 & 23, refer to the table

Kids taking AP Courses in grade 12 in Henry County in 2013-17					
	2013	2014	2015	2016	2017
AP Biology	353	379	407	442	461
AP Math	251	273	308	339	358
AP Physics	233	271	311	349	369
AP Spanish	609	638	661	697	732
AP French	113	129	142	168	179

22

In the choices given, what is closest to the average rate of change in the number of kids taking AP Biology from 2013 to 2017?

- A) 22
- B) 27
- C) 32
- D) 37

23

In the choices given, which subject's ratio of its numbers in 2013 and 2017 is closest to ratio of AP French's numbers in 2013 and 2017?

- A) AP Biology
- B) AP Math
- C) AP Physics
- D) AP Spanish

24

If the center of a circle is at (5, 1) and the point (13, 7) is on the circle, what is the equation for the circle?

- A) $(x - 5)^2 + (y - 1)^2 = 10^2$
- B) $(x - 1)^2 + (y - 5)^2 = 10^2$
- C) $(x - 5)^2 - (y - 1)^2 = 10^2$
- D) $(x - 1)^2 - (y - 5)^2 = 10^2$

4

Calculator is allowed

25

A basketball is released from the top of a 500 meters tall building. Approximately how much time (in seconds) after being released, will it reach the ground? Use the following formula. _

$$S = ut + \left(\frac{1}{2}\right)gt^2$$

where

S = distance traveled in meters

u = initial velocity in meters/second

t = time taken in seconds

g = acceleration due to gravity = $9.81 \frac{\text{meters}}{\text{second}^2}$

- A) 2 seconds
- B) 3 seconds
- C) 5 seconds
- D) 10 seconds

26

Sweaters made of natural wool cost 20% more than the ones made out synthetic materials. Based on that observation, if a wool sweater costs \$204, how much should a similar sized synthetic materials sweater cost?

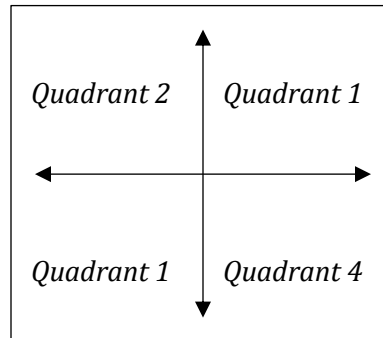
27

Ten random trees in an orange grove with 1000 trees are numbered "One" through "Ten". They have the following numbers of oranges on them. Approximately, what is the number of oranges in the orange orchard? _

Tree #	# of Oranges
One	1051
Two	1129
Three	1206
Four	918
Five	1108
Six	1204
Seven	1081
Eight	812
Nine	871
Ten	1023

- A) 10,000
- B) 100,000
- C) 1,000,000
- D) 10,000,000

28



Graph the following inequalities in the xy -plane. Which of the following choices is a FALSE statement regarding the solutions to the inequalities given below?

$$y \geq \frac{3}{5}x + 4$$

$$y > 3x + 2$$

- A) Quadrant 1 contains part of the solution
- B) Quadrant 2 contains part of the solution
- C) Quadrant 3 contains part of the solution
- D) Quadrant 4 contains part of the solution

4

Calculator is allowed

29

Which of the following is equivalent to

$$\left(\frac{1}{100}x^{50} + \frac{1}{10}\right) - \left(\frac{1}{50}x^{50} - \frac{1}{5}\right) ?$$

- A) $\frac{1}{100}x^{50} + \frac{1}{10}$
B) $\frac{1}{100}x^{50} - \frac{1}{10}$
C) $-\frac{1}{100}x^{50} - \frac{3}{10}$
D) $-\frac{1}{100}x^{50} + \frac{3}{10}$

30

If the equation of a parabola is

$$y = -3x^2 - 6x + 4$$

find the vertex of the parabola.

- A) (10,1)
B) (-10,1)
C) (1,10)
D) (-1, 10)

4

Calculator is allowed

DIRECTIONS

For the questions 31-38, solve the questions and write the answers in the grid

A) You may want to write the answers above the bubbles to help you fill in the correct bubbles. Credit is given only for filling in the correct bubbles on the answer sheet.

B) Fill in only one bubble in each column.

C) you will not be penalized for a negative answer.

D) some questions may have two or more correct answers. In that case fill in the bubble for only one correct answer.

E) If your answer is a MIXED NUMBER, such as $5\frac{1}{2}$, convert it to a decimal number, i.e. 5.5 or an improper fraction, i.e. $\frac{11}{2}$ and entered in to the grid as such. Do not enter it in the grid as 5 1/2. It will be taken as $\frac{51}{2}$

F) If your answer is a DECIMAL NUMBER with more digits than the number of columns in the grid, you must either round off or truncate the answer.

If answer = $11/2$

It can be entered in the grid in any of the two ways shown below.

	1	1	/	2			5	.	5
/	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	/	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If answer = $5/9$

It can be entered in the grid in any of the three ways shown below.

		5	/	9		.	5	5	5		.	5	5	6
/	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	/	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	/	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	5	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	5	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If answer = 301

It can be entered in the grid in any of the two ways shown below.

You can start entering the digits in any column. Leave unused columns blank.

		3	0	1			3	0	1	
/	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	/	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	0	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	3	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4 Calculator is allowed

31

At his best pace, John can put in at most 10 dozen rivets per hour. At his worst pace, he can put in at least 8 dozen rivets per hour. John has to put in a total of 120 dozen rivets. What is a possible amount of time, in hours, it could take him, to put in those rivets?

32

The posted weight limit for a boat is 5000 pounds. The weight of the empty boat is 3000 pounds. The weight of the boatman is 200 pounds. How many bricks, each weighing 12 pounds, can the boat carry?

33

Based on the graph below, what is the ratio of cars sold in 2006 to 2014?



34

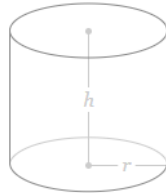
A grocery superstore needs 20 hourly employees, 24 hours a day, 7 days a week to keep things humming along. If each employee can be given work in multiples of 15 minutes time slots, how many 15 minute time slots does the grocery superstore need to fill every week?

4

Calculator is allowed

35

John uses a right circular cylinder shown below, to store water.
 If the volume of the cylinder is 250π cubic feet, what is the diameter of the base of the cylinder in feet?
 It is given that the height of the cylinder is 10 feet.



36

For what value of "y" is the function "f" undefined?

$$f(y) = \frac{1}{(y-15)^2 + 10(y-15) + 16}$$

37

Julie opened a bank account. She deposited \$1000 as the beginning amount in the account. The bank manager told her that the account would grow at 5% interest, compounded annually.
 The bank manager gave her the formula $= \$1000(i)^y$; where
 "i" is based on the annual compound interest and
 "y" represents the number of years after which the compound interest is to be calculated.
 What should Julie replace the "i" with, if she wants to find the amount of money in her account after "y" years?

38

Julie's friend Kristin opened an account at another bank. Kristin was informed that her account would grow at 6% interest, compounded annually. Julie's bank offered her 5% interest compounded annually. If Julie and Kristin both deposit \$1000 in their accounts on day 1. They let the money grow in their respective accounts, and do not withdraw anything from their accounts, how much more will Kristin have after 15 years?

STOP

If you finish before time is called, you may check your work on this section only.
 Do not turn to any other section.