Math Level 2 SAT Practice Test 14

Q1. Define an operation $\vee$ on the set of real numbers as follows:
For any two real numbers
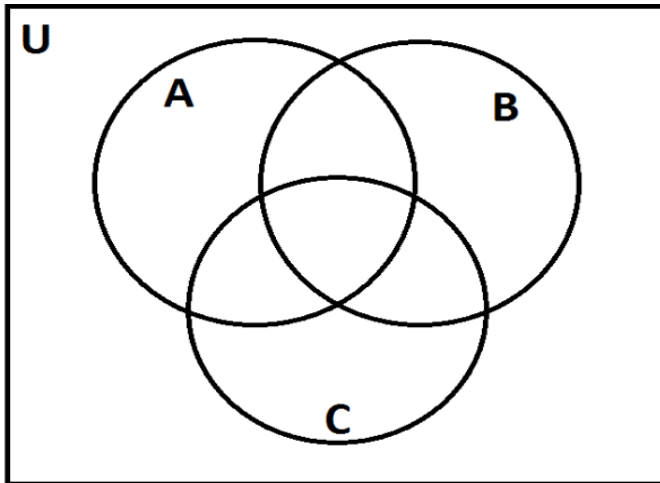**a,b,**
$a\vee b=||a-2b|+|2a-b||$
.Evaluate
$100\vee(-50)$
.
    A. 450
    B. 250
    C. 200
    D. 350
    E. 150

Q2.
The above represents a Venn diagram. The universal set U is the set of all positive integers.Let A be the set of all multiples of 2; let B be the set of all multiples of 3; let C be the set of all multiples of 5. As you can see, the three sets divide the universal set into eight regions. Suppose each positive integer was placed in the correct region. Which of the following numbers would be in the same region as 873?
    A. 365
    B. 368
    C. 367
    D. 366
    E. 369

Q3. Define the functions f and g on the set of real numbers as follows:

$$f(x) = \sqrt{x - 16}$$
$$g(x) = \sqrt{x - 4}$$

Give the natural domain of the composite function f∘g

    A. [16,∞)
    B. [260,∞)
    C. [0,∞)
    D. [4,∞)
    E. [32,∞)

Q4. Define $f(x) = \dfrac{x - 4}{x - 7}.$

Give the range of f.

    A. (−∞,7)∪(7,∞)
    B. (−∞,4)∪(4,∞)
    C. (−∞,4)∪(4,7)∪(7,∞)
    D. The correct range is not among the other responses.
    E. (−∞,4)∪(7,∞)

Q5. Define $f(x) = \dfrac{x - 4}{x - 7}.$

Give the range of f.

    A. (−∞,4)∪(4,∞)
    B. (4,7)
    C. (−∞,4)∪(4,7)∪(7,∞)
    D. (−∞,7)∪(7,∞)
    E. (−∞,4)∪(7,∞)

Q6. What is the slope of the function:
2y−3=8x+13

    A. 4
    B. 3
    C. 8
    D. 2

Q7. Define g(x)=5−log4(x+5)
Give the y-coordinate of the y-intercept of the graph of g (nearest hundredth).

    A. 4.60
    B. 6.16
    C. 4.14
    D. 3.84
    E. 4.83

Q8. Define $f(x) = 2 \cdot 3^{x-4} - 7$

Give the x-coordinate of the x-intercept of the graph of (nearest hundredth).

    A. 4.42
    B. 6.98
    C. 4.18
    D. The graph of f has no x-intercept.
    E. 5.14

Q9. Rewrite as a single logarithmic expression:

ln(y+1)−ln(y+2)+ln(y+3)
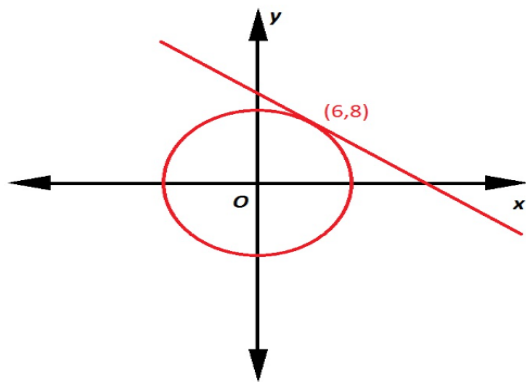
A. ln(y+2)

B. $= \ln \dfrac{y^2 + 4y + 3}{y + 2}$

C. ln(y+4)

D. $= \ln \dfrac{y + 1}{y^2 + 5y + 6}$

E. $\ln \dfrac{y^2 + 3}{y + 2}$

Q10.

Refer to the above figure. The circle has its center at the origin. What is the equation of the circle?
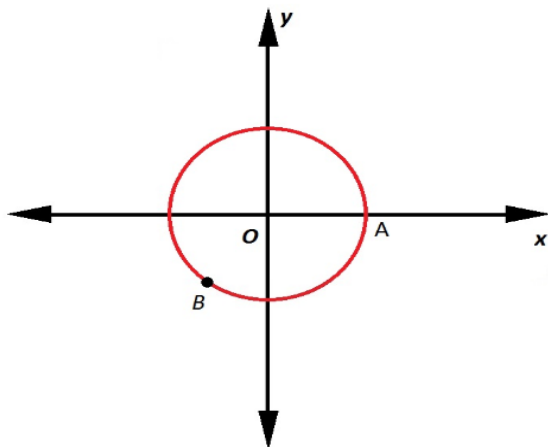
A. $x^2 + y^2 = 100$

B. $\dfrac{y^2}{64} - \dfrac{x^2}{36} = 1$

C. $\dfrac{x^2}{36} - \dfrac{y^2}{64} = 1$

D. $$x^2 + y^2 = 10$$

E. $$\frac{x^2}{36} + \frac{y^2}{64} = 1$$

Q11.
Refer to the above diagram. The circle has its center at the origin; B is the point (−9,−12). What is the length of the arc AB^, to the nearest tenth?

 A. 18.8
 B. 33.2
 C. 16.6
 D. 37.5
 E. 56.8

Q12. Which of the following numbers comes closest to the length of line segment in three-dimensional coordinate space whose endpoints are the origin and the point (3,4,5)?
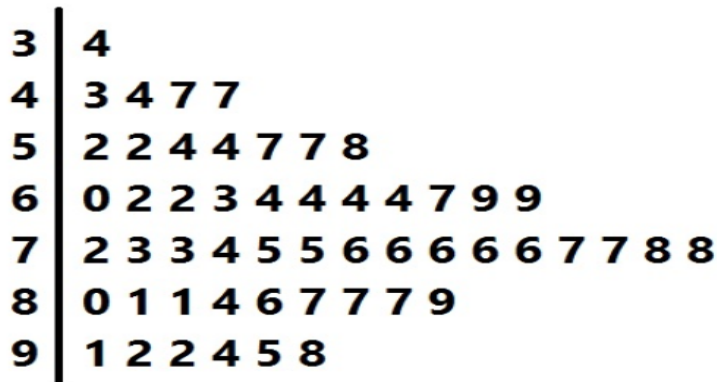
 A. 8
 B. 6.5
 C. 7.5
 D. 7
 E. 8.5

.**Q13.** The area of a regular pentagon is 1,000. Give its perimeter to the nearest whole number.

 A. 121
 B. 118
 C. 199
 D. 107
 E. 91

Q14. A decagon is a ten-sided polygon.Decagon ABCDEFGHIJ has diagonal $\overline{AC}$ **with length 10. To the nearest tenth, give the length of one side.**
    A. 5.9
    B. 8.3
    C. 8.7
    D. 6.2
    E. 5.3

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3 | 4
4 | 3 4 7 7
5 | 2 2 4 4 7 7 8
6 | 0 2 2 3 4 4 4 4 7 9 9
7 | 2 3 3 4 5 5 6 6 6 6 6 7 7 8 8
8 | 0 1 1 4 6 7 7 7 9
9 | 1 2 2 4 5 8
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Q15.
Above is the stem-and-leaf display for a group of test scores. Order the mean, the median, and the mode of the scores from least to greatest.
    A. Median, mode, mean
    B. Median, mean, mode
    C. Mean, mode, median
    D. Mode, median, mean
    E. Mean, median, mode