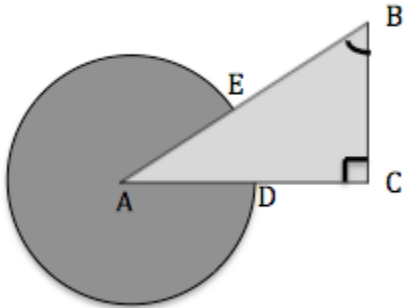


# UBMS STATE PROGRAM

## MATH SECTION:

1) As shown in the figure below, A is the center of the circle, and right triangle ABC intersects the circle at D and E. Point D is the midpoint of AC, which is 22 cm long. The shaded region inside the circle and outside the triangle has an area of  $110\pi$  square centimeters. What is the measure of angle B?



- A.  $45^\circ$
- B.  $48^\circ$
- C.  $50^\circ$
- D.  $54^\circ$
- E.  $57^\circ$

2) A box contains 50 cards.  $\sqrt{1}$  is written on the first card,  $\sqrt{2}$  on the second,  $\sqrt{3}$  on the third and so on through  $\sqrt{50}$ , with no numbers repeated. A card is drawn at random from the box. What is the probability that the number on the card is an irrational number?

- A.  $0/50$
- B.  $7/50$
- C.  $25/50$
- D.  $35/50$
- E.  $43/50$

3) What would "s" have to be so that  $x^3 + 5x^2 + sx + 6$  is divisible by  $(x + 2)$ ?

- A. 9
- B. 5
- C. 2
- D. -6
- E. -13

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4) Find the slope-intercept form of the equation of the line which passes through the

point  $(7, -4)$  and which is parallel to the line through the points  $(6, 3)$  and  $(4, -1)$ .

5) A number of the form  $213ab$ , where  $a$  and  $b$  are digits, has a remainder less than 10 when divided by 100. The sum of all the digits in the above number is equal to 13. Find the digit  $b$ .

- A) 5
- B) 7
- C) 6
- D) 8
- E) 9

6)  $3^{102} + 9 \times 3^{100} + 3^{103} / 3 = ?$

- A)  $3^{101}$
- B)  $3^{102}$
- C)  $3^{103}$
- D)  $3^{104}$
- E)  $3^{105}$

7) Of the 80 students in class, 25 are studying German, 15 French and 13 Spanish. 3 are studying German and French; 4 are studying French and Spanish; 2 are studying German and Spanish; and none is studying all 3 languages at the same time. How many students are not studying any of the three languages?

- A) 27
- B) 18
- C) 53
- D) 62
- E) 36

## UBMS STATE PROGRAM

$$8) 2x - 3y = -14$$

$$3x - 2y = -6$$

If  $(x, y)$  is a solution to the system of equations above, what is the value of  $x - y$  ?

A)  $-20$

B)  $-8$

C)  $-4$

D)  $8$