Stage I   Question Set 4

1) 20 questions
2) Completion time 30 to 40 minutes
3) Calculators are permitted
4) No penalty for incorrect answers
5) Diagrams are not drawn to scale

QUESTION #1:

$\dfrac{4}{x} = \dfrac{x}{4}$ **x < 0. Evaluate for x.**

a) x = -1   b) x = 2   c) x = -2   d) x = -4   e) none of the above

QUESTION #2:

Evaluate $2^3 + 2^4 + 1$

a) 20   b) 25   c) 17   d) 15   e) none of the above

QUESTION #3:
Find the smallest value in the set . $\left\{ x - 1, \sqrt{x}, \sqrt{x} + 1, \dfrac{1}{x} \right\}, \; x = 1$

a) x –1   b) √x   c) √x + 1   d) 1/x
e) There is more than one element of the set which is the lowest value.

QUESTION #4:
Last year, twice as much rain fell in Raintown as fell in Drydale. If 40 cm of rain fell in Drydale, how much fell in Raintown?

a) 20 cm   b) 80 cm   c) 60 cm   d) 40 cm   e) none of the above

QUESTION #5:

Evaluate $\dfrac{\sqrt{x}}{x} + \sqrt{x}$ where $x = 16.$

a) 4 ¼   b) 4 1/16   c) 4 1/8   d) 16 ¼   e) none of the above

QUESTION #6:
Which of the following statements are true?

a) The product of 6 and 2 is greater than the sum of 4 and 8.
b) The sum of -5 and 3 is smaller than the difference of 8 and 10.
c) The quotient of 5 and 3 is equal to 2.
d) The product of 3 and 5 and 4 is greater than the quotient of 120 and 3.
e) none of the above

QUESTION #7:
Which of the following statements are true?

a) 724 is divisible by 4.
b) 1011 is divisible by 3.
c) 1836 is divisible by 12.
d) all of the above
e) none of the above.

QUESTION #8:
How many prime numbers are there between 12 and 24?

a) 5   b) 3   c) 4   d) 6   e) none of the above

QUESTION #9:
Zorro's new computer system cost $1,800, which was the marked-down price after his ten-percent student discount was applied. What was the original price of the computer system?

a) $2,200   b) $2,300   c) $2,100   d) $2,050   e) none of the above
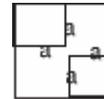

QUESTION #10
Walter is an adventurous solo pilot. He completed a lengthy plane trip in which he flew 1200 air-miles at a rate of 500 miles/hour, and then flew 3000 air miles at a rate of 600 miles/hour. How many hours did his trip take in total, assuming he flew non-stop?

a) 11 hours   b) 7.4 hours   c) 8 hours   d) 6.5 hours   e) none of the above

QUESTION #11
The large square is 8 cm x 8 cm, and two squares with dimensions a x a have been cut away. Find the value for a in cm if the remaining area is 48 cm².

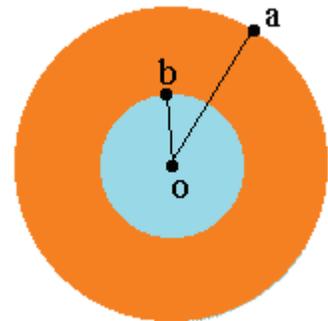a) $2\sqrt{2}$ b) 4   c) $4\sqrt{2}$ d) 2   e) none of the above

QUESTION #12
O is the center of both circles. OA = 10 cm. OB = 4 cm. What is the area of the shaded (or orange) doughnut-shaped region in cm²?
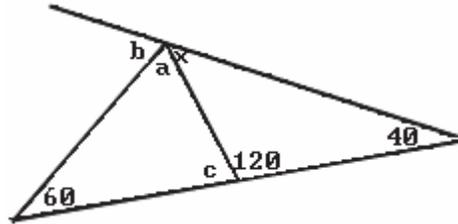
a) 86 π   b) 72π   c) 84π   d) 76π   e) none of the above

QUESTION #13:
x + a = 24. a + b = 14. b = 3. What does x equal?

a) x = 10   b) x = 13   c) x = 21   d) x = 12   e) none of the above

QUESTION #14:
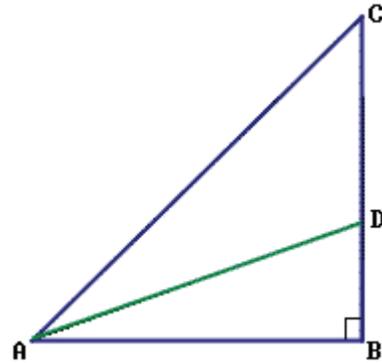**What does b equal?**

a) 90   b) 85   c) 110   d) 100   e) none of the above

QUESTION #15
BD = 1. CD = 2. AB = 4.

What is the area of triangle ACD in units²?

a) 5   b) 3   c) 4   d) 6   e) none of the above

QUESTION #16:
Diane has $2 in change, with no $1 or $2 coins, and no pennies. Diane may or may not have any quarters, dimes, or nickles. Which of the following statements are true?

a) If Diane has 6 quarters, at least one of the remaining coins must be a nickle.
b) If Diane has 7 quarters, at least one of the remaining coins must be a nickle.
c) If Diane has 7 dimes, at least one of the remaining coins must be a nickle.
d) a & c
e) b & c

QUESTION #17
Which of the following statements are true?

a) A cube has 6 surfaces, 8 vertices, and 12 edges.
b) The volume of a cube which has dimensions 3m x 3m x 3m is greater than that of a rectangular solid with dimensions 1m x 2m x 4m.
c) The surface area of a cube which has dimensions 3m x 3m x 3m is greater than the surface area of a rectangular solid with dimensions 1m x 2m x 4m.
d) a & c only
e) a, b & c

QUESTION #18:
A cube has dimensions s x s x s. A rectangular solid has dimensions (s - 1) x s x (s + 1).
If the rectangular solid has a volume which is 5 cubic units less than the cube, what are the dimensions of the rectangular solid?

a) 6 x 7 x 8   b) 2 x 4 x 6   c) 4 x 5 x 6   d) 5 x 5 x 5   e) 3 x 5 x 7

QUESTION #19:
The circumference of the larger circle is three times greater than that of the smaller circle. What is the area of the larger circle in units²? O is the centre of both circles.

a) 84π b) 144π c) 72π d) 96π e) none of the above
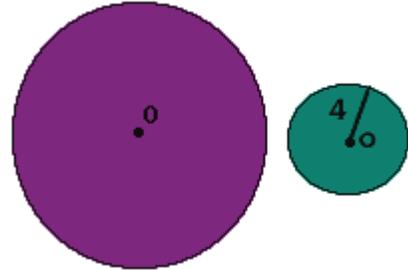
QUESTION #20:
Donald is painting the door of his bedroom. If the dimensions of the door are 2.5 m x 40 cm x 3 cm, how much surface area will Donald have to paint in m²?

a) 2.7   b) 0.03   c) 300   d) 2.174   e) none of the above