

SOLUTIONS: Stage I Question Set 7

Solution to Question #1:

$4.\bar{9}$ is equal to 5, since $0.999\dots = 1$.
All of the other elements are also equal to 5.
The correct answer is (e).

Solution to Question #2:

$-54 + y = 36$, which means that $y = 36 + 54 = 90$.
The correct answer is (b).

Solution to Question #3:

$\frac{1}{2}(\$9.72) = \4.86 .
The correct answer is (a).

Solution to Question #4:

Evaluate $(\sqrt{2})^7$
 $= (2)(2)(2)\sqrt{2} = 8\sqrt{2}$
The correct answer is (d).

Solution to Question #5:

The average of 10.1 and 100 = $\frac{1}{2}(10.1 + 101) = \frac{1}{2}(111.1) = 55.55$
The correct answer is (e).

Solution to Question #6:

5000 seconds = $5000/60 = 83$ minutes and 20 seconds. Sandy left at 9:23 a.m.
The correct answer is (d).

Solution to Question #7:

$-2(-250) = 500$
The element with the largest absolute value is -1000, since the absolute value of -1000 is 1000.
The correct answer is (b).

Solution to Question #8:

If the larger square has an area of 16, the area of the smaller square is 8.
The side length of the smaller square is the square root of 8, which equals $2\sqrt{2}$ units.
The correct answer is (c).

Solution to Question #9:

The minimum number is the minimum number in the first sequence which is divisible by 7.
The first sequence extends to $\{1, 5, 9, 13, 17, 21, \dots\}$.
The minimum number is 21, which is the minimum number shared by both sequences.
The correct answer is (c).

Solution to Question #10:

If the area is 14m^2 , and the length is 4m, the width is $14 \div 4 = 3.5\text{m}$.
The perimeter = $(2 \times 3.5) + (2 \times 4) = 15\text{m}$.
The correct answer is (c).

Solution to Question #11:

Biology:	60/72	= 83.3%
English:		= 79%
Mathematics:	81/85	= 95.3%
Physics:	93/103	= 90.3%

History: $\quad\quad\quad = 91\%$
English was Eileen's lowest score. The correct answer is **(b)**.

Solution to Question #12:

$144 = 12^2$, but is not a perfect cube of any natural number.
 $81 = 9^2$, but is not a perfect cube of any natural number.
 $256 = 16^2$, but is not a perfect cube of any number.
128 is not a perfect square of any natural number.
The correct answer is **(e)**

Alternate approach:

64 is the 6th power of 2. To be a perfect square as well as a perfect cube, the next such number must be the 6th power of some natural number. That number is 6th power of 3 = 729. The correct answer is **(e)**

Solution to Question #13:

$7/8(N) = 56$, so $N = 56 \times 8/7 = 64$.
But the question is what is $8/7$ of N , which is $(8/7) \times 64 = 512/7 = 73 \frac{1}{7}$.
The correct answer is **(d)**.

Solution to Question #14:

In a triangle, the largest side is always less than the sum of the two smaller sides.
a) $\{5,6,12\}$ $5 + 6 = 11$ which is less than 12, so this cannot be the values for a triangle.
b) $\{4,3,7\}$ $4 + 3 = 7$, which is equal to the third "side," so these cannot be values for the sides of a triangle.
c) $\{1,2,1\}$ $1 + 1 = 2$, which is equal to the purported third side.
d) $\{7.5,2.5,10\}$ $7.5 + 2.5 = 10$, which is also equal to the purported third side.
e) none of the above. Since none of the above are possible values for a triangle, this is the correct choice.
The correct answer is **(e)**.

Solution to Question #15:

The yellow-shaded region has an area of $(3 \times 5) - (1.5 \times 4) = 15 - 6 = 9 \text{ cm}^2$
The blue-shaded region has an area of $(1.5 \times 4) - (1 \times 3) = 6 - 3 = 3 \text{ cm}^2$
The red-shaded region has an area of $1 \times 3 = 3 \text{ cm}^2$
The blue and red regions are equal.
a) False, since the blue and red are equal.
b) False, since the red and blue are equal.
c) False, since the blue and red are equal.
d) False, since a) & c) are both false.
e) True, since a) - d) are false.
The correct answer is **(e)**.

Solution to Question #16:

Five students specialize in both, since there are then:
12 students who specialize in painting only
13 students who specialize in photography only
5 students who specialize in both
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30 The correct answer is **(b)**.

Solution to Question #17:

The value of each row, column or diagonal = $14 + 9 + 10 = 33$.
The value of the middle square is $33 - (9 + 13) = 11$.
The value of the lower left hand square is $33 - (10 + 11) = 12$
 $N = 33 - (14 + 12) = 7$.
The correct answer is **(b)**.

Solution to Question #18:

Each such square must share a corner with the larger square.

There are four corners and, therefore, four such squares.

The correct answer is **(b)**.

Solution to Question #19:

a) Joseph will work Friday, April 26. False.

b) Joseph will work Sunday, April 28. False.

c) Joseph will work Saturday, April 27. False.

! d) Joseph will work Wednesday, May 1. True.

e) none of the above. False, since d) is true.

The correct answer is **(d)**.

Solution to Question #20:

$$\$200 \text{ (Can)} = 200 \left(\frac{0.72}{0.78} \right) = \$184.62 \text{ Australian}$$

The correct answer is **(a)**.