

SOLUTIONS: Stage I Question Set 9

Solution to Question #1:

$$1.5 - 0.5 + 1.2 - 0.3 = 1.9$$

The correct answer is (c) .

Solution to Question #2:

a,b are natural numbers. $ab = ba$ by the commutative principle, so $(ab - ba)(a) = 0$

The correct answer is (a) .

Solution to Question #3:

$$890 - 750 - 85 = \$55.$$

The correct answer is (d) .

Solution to Question #4:

a) $4^2 - 8 - 6.5 = 1.5$

b) $5^3 + 5^2 - 147.5 = 2.5$

c) $382 - 380.5 = 1.5$

d) $1002 - 101.5 = 900.5$

e) none of the above

The correct answer is (b)

Solution to Question #5:

Just do the inverse of the operations. 18 divided by 9 is 2. 2 multiplied by 2 is 4. 4 divided by 3 is $4/3$.

The correct answer is (d) .

Solution to Question #6:

$$501.2 \times 2.1 = 1052.52. \text{ 1052.52 rounded to the nearest whole number is 1053.}$$

The correct answer is (b) .

Solution to Question #7:

$$200 \div 1.6 = 125 \text{ miles per hour.}$$

The correct answer is (c)

Solution to Question #8:

T = the number of tickets Travis buys. The number of tickets that makes a season ticket worthwhile is when $15T > 250$. $T = 17$, since T must be a whole number.

The correct answer is (b) .

Solution to Question #9:

The original cube has surface area of $6(3 \times 3) = 54 \text{ cm}^2$

Each rectangular solid has surface area of $(1 \times 3)(4) + (3 \times 3)(2) = 12 + 18 = 30 \text{ cm}^2$

The total surface area of the three rectangular solids is $30(3) = 90 \text{ cm}^2$

The total surface area of the three rectangular solids exceeds the surface area of the cube by 36 cm^2 .

The correct answer is (c) .

Solution to Question #10:

The length of AB is $84 - 12 = 72$. $AC = 3(72)/4 = 54$. C is at $12 + 54 = 66$.

The correct answer is (d) .

Solution to Question #11:

The tallest rectangle has an area of $4(1) = 4 \text{ cm}^2$

The next rectangle has an area of $(3/4)(4)(1) = 3 \text{ cm}^2$

The shortest rectangle has an area of $(3/4)(3/4)(4)(1) = 2.25 \text{ cm}^2$

The total area of the rectangles = $4 + 3 + 2.25 = 9.25 \text{ cm}^2$

The unshaded area = $25 - 9.25 = 15.75 \text{ cm}^2$

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

Solution to Question #12:

a) The circle can fit within the square. True.

b) The rectangle has the same area as the square. True, since the area of the rectangle is $\frac{1}{2}(2)(\pi)^2$ and the area of the square = π^2 , so the two are equal.

c) The perimeter of the rectangle is greater than the perimeter of the square is greater than the circumference of the circle. The perimeter of the rectangle is 5π . The perimeter of the square is 4π . The circumference of the circle is π^2 . The perimeter of the rectangle is greater than the perimeter of the square is greater than the circumference of the circle, so this statement is true.

d) all of the above. True, since a), b) and c) are true.

e) none of the above. False.

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

Solution to Question #13:

At its first birthday, this animal will be 1 foot tall. At its fourth birthday, this animal will be 1.5 feet tall.

The animal grew 0.5 feet between its first and fourth birthdays.

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

Solution to Question #14:

The only prime number which ends in 5 is 5. All other positive numbers which end in 5 are divisible by 5.

The answer is 5.

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

Solution to Question #15:

The two solids have dimensions of $12 \times 3 \times 3$ and $8 \times 1 \times 1$ (in meters). The total volume is $(12 \times 3 \times 3) + (8 \times 1 \times 1) = 108 + 8 = 116 \text{ m}^3$

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

Solution to Question #16:

w = weight of the glass; c = weight of 8 ounces of the concoction

$w + c = 600$; $w + c/2 = 400$; $c/2 = 200$; Therefore, $w = 200\text{g}$.

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

Solution to Question #17:

There are two triangles. The larger triangle has an area of $(\frac{1}{2})(8)(10) = 40\text{m}^2$.

The smaller triangle has an area of $(\frac{1}{2})(4)(5) = 10 \text{ m}^2$. The total area is 50m^2 .

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

Solution to Question #18:

Each of the smaller cylinders has surface area = $2\pi(\text{radius} \times \text{height}) = 50\pi \text{ cm}^2$ when flattened out into a rectangle. The width of each cylinder is 10π and the height is 5. If you put all four cylinders together with the long sides on top of each other, you will have a rectangle with dimensions 40π and a height of 5. None of the other choices are correct.

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

Solution to Question #19:

$A + B + 8 = C + B + 6 = 25$; $A + 8 = C + 6 = 25 - B$; $C + B = 19$; $C + B + A = 25$

So $A = 6$. $6 + B + 8 = 25$, so $B = 11$. $C = 8$

$(C + B - A) = (8 + 11 - 6) = 13$

The correct answer is **(c)**

Solution to Question #20:

The speed of light is about 18,000,000 km/minute, and there are 1440 minutes in a day. Light travels $18,000,000 \times 1440 = 25,920,000,000$ km in one day. Round this to 2.6×10^{10} .

$2.6 \times 10^{10} (365)(4.2) \sim 4 \times 10^{13}$

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