第四套

1. A typist can type 45 words per minute. He increases his speed by 20 per cent. How many words can he now type per **hour** ?

2. If 2y - x = 8 , and 3x - y = 1, what is the value of x ?

3. The sum of four consecutive integers is 410. What is the value of the least of these integers?

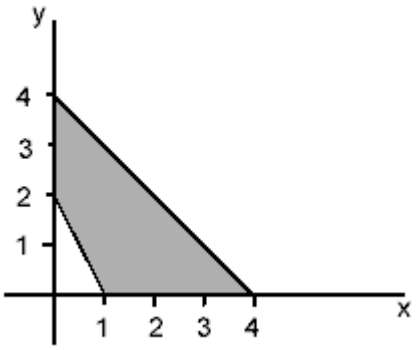
4. On a map showing only four countries, A, B, C and D, A shares a border with B and C. Country D shares a border with B and C. But countries B and C and countries A and D do not share borders. If the map requires different colours for countries with common borders, what is the minimum number of colours required to complete the map?

5. A square has sides s and diagonal d. If $2s^2 + d^2 = 100$, what is the value of s?

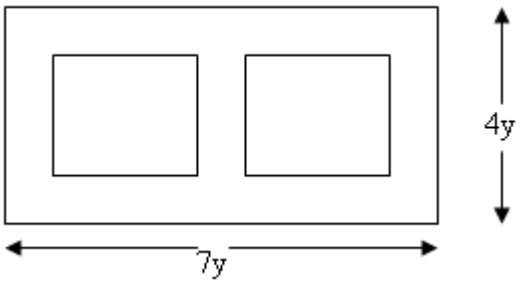
6. Different four-letter passwords can be constructed using the letters A, B, C and D only once. How many such passwords exist if either C or B must be in second position?

7. A book distributor sends out standardized packages weighing 1, 1.5 or 2 kilograms. If during one week 40 per cent of the packages weigh 1 kg, 50 per cent weigh 1.5 kg and 10 per cent weigh 2 kg, what is the average weight in kilograms of the parcels that week?

8. If two lines intersect at apoint to form four angles, and one angle is twice as large as its adjacent (neighboring) angle, what is the degree measure of the smallest angle?



9. What is the area of the shaded region?



10. Two square flowerbeds are placed symmetrically in a rectangular garden as shown in the diagram. The distance between the beds is y and so is the width of the border around the beds on all sides. A seed blown into the garden by the wind is equally likely to land anywhere in the garden. What is the probability that it actually lands in a flowerbed?

参考答案

1.Correct Answer: 3240

Explanation:

A 20 per cent increase on 45 words per minute = 1.2 x 45 = 54 words per minute.

To get words per hour, multiply by 60 = 3240

2.Correct Answer: 2

Explanation:

This is a pair of simultaneous equations. Rearrange :

2y - x = 8; -y +3x = 1; multiply the second by 2

-2y + 6x = 2; then add to the first to give

5x = 10; x = 2

3.Correct Answer: 101

Explanation:

Four consecutive integers can be written n + (n + 1) + (n + 2) + (n + 3)

Their sum = 4n + 6 = 410

4n = 404; n = 101

4.Correct Answer: 2

Explanation:

Draw a diagram.

A and D can be the same color because they do not share a border. Also B and C can be one color, but B and C must differ from A and D. So two colors are needed.

5.Correct Answer: 5

Explanation:

The diagonal and two sides form an isosceles right triangle.

Using Pythagoras $s^2 + s^2 = d^2$; $2s^2 = d^2$

Since these terms are equal we can replace d^2 in the given equation

Hence $2s^2 + 2s^2 = 100$; $4s^2 = 100$; $s^2 = 25$; $s = 5$

6.Correct Answer: 12

Explanation:

First imagine C in second position. This gives a choice of 1 out of three for first place, and one out of two for third place. This is equivalent to 6 possible combinations.

Now putting B in second place and using the same logic there are 6 more combinations.

Total = 12

7.Correct Answer: 1.35

Explanation:

This is a weighted average problem.

The average weight = (40 x 1 + 50 x 1.5 + 10 x 2) 100

(40 + 75 + 20)/100 = 1.35

8.Correct Answer: 60

Explanation:

Let the smallest angle = x

The sum of two vertically opposite angles = 2x

The sum of the other pair of vertically opposite angles = 360 - 2x

But since they are double the measure of angle x their sum also = 4x

Equating gives 360 - 2x = 4x; 360 = 6x; 60 = x

[Or even simpler: the sum of one angle and its neighbor =180. The angles are x and 2x, so 3x = 180 ; x = 60]

9.Correct Answer: 7

Explanation:

The area of the shaded region is the area of the large triangle enclosed between the axes minus the area of the small un-shaded triangle.

8 - 1 = 7

10.Correct Answer: 2/7

Explanation:

The probability is the ratio of the area of the beds to the total area. The sides of the square beds = 4y – 2y = 2y. Area of one bed = $4y^2$. Area of two beds = $8y^2$. Total area is 4y x 7y = $28y^2$. Probability = 8/28 = 2/7