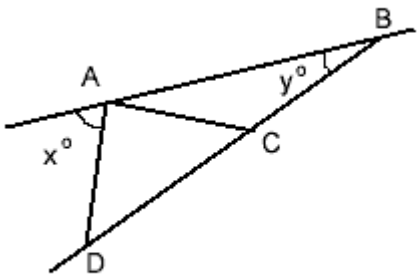
第二套

1. What is the sum of all the positive integer factors of 12 ?

2. The average IQ of 4 people is 110. If three people each have an IQ of 105, what is the IQ of the fourth person ?

3. Of 60 students in a class 2/3 are girls, and 2/5 of the class are taking music lessons. What is the maximum number of girls that are not taking music lessons?

4. If $2^{n+1} = 8$, what is the value of n ?

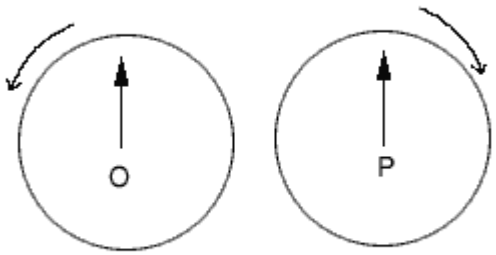


(figure not to scale)

5. In the figure above, AD = AC = CB.

If the value of y is 28, what is the value of x?

6. One gallon of fuel mixture contains antifreeze in the ratio of 5 parts fuel to one part antifreeze. To this is added half a gallon of mixture which is one third antifreeze and two thirds fuel. What is the ratio of fuel to antifreeze in the final mixture? (Grid your answer as a fraction: fuel/antifreeze)



7. Two dials O and P have pointers that start from the vertical position as shown. Pointer O rotates anticlockwise at a rate of 5 degrees per second and pointer P rotates clockwise at 9 degrees per second. How many complete revolutions will P have made when O completes 335 complete revolutions?

8. What is the total surface area of 2 identical cubes which together have a volume of 1458 units?

9. N {12,18,2,6}

P {1,4,2,3}

If n and p are to be selected at random from sets N and P respectively, what is the probability that n/2p will be a member of set P?

10. If $f(x) = (12 \text{ } x)^{3/2}$, and n = f(3), what is the value of 2n?

参考答案

1.Correct Answer: 28

Explanation:

The positive integer factors of 12 are: 1,12,2,4,3,6

Their sum is 28

2.Correct Answer: 125

Explanation:

If the average of four is 110, the total = 4 x 110 = 440

The sum of three with IQ 105 = 315

The fourth person must have IQ = 440 - 315 = 125

3.Correct Answer: 36

Explanation:

If 2/3 of the class of 60 are girls (=40), 1/3 must be boys (=20)

2/5 of the class (=24) are taking music.

The maximum number of girls not taking music will be when all the boys take music.

If all 20 boys take music, then only 4 girls need to take it, so 36 girls do not take music lessons.

4.Correct Answer: 2

Explanation:

8 is 2 raised to the power of 3

3 = n + 1; n =2

5.Correct Answer: 84

Explanation:

In triangle ABC angles CAB and CBA are equal (isosceles triangle). And both are 28.

Angle ACD = 56 (exterior angle = sum of two opp. interior angles)

Angles ACD and CDA are equal (isosceles triangle)

Angle DAC = 180 - 112 = 68

The angle marked x = 180 - 68 - 28 = 84

6.Correct Answer: 7/2

Explanation:

The antifreeze in the initial fuel mixture is 1/6 of one gallon.

The added mixture contains 1/3 of half a gallon = 1/6 of a gallon

The final mixture contains 1/6 + 1/6 in 1.5 gallon

2/6 antifreeze in total 9/6 gallons

Fuel in the mixture is 9/6 - 2/6 = 7/6

Ratio fuel to antifreeze = 7/6 : 2/6 = 7 : 2

Grid in as 7/2

7.Correct Answer: 603

Explanation:

When O completes 335 revolutions it will have turned through 335 x 360 degrees.

At a rate of 5 degrees per second this means 335x 360 /5 seconds

P will have turned through 9 x 335 x 360 /5 degrees in the same time

Now divide by 360 to get complete revolutions = 9 x 335 / 5 = 603

8.Correct Answer: 972

Explanation:

Volume of one cube = 1458/2 = 729; the cube root will give the side of each cube.

The cube root of this = 9 (If you do not spot this you can find the prime factors then you will see the cube root is 9)

If the side of the cube =9, the area of one face = 81. There are six faces so the surface area = 6 x 81 =486

But there are two cubes so the total surface is 2 x 486 =972

9.Correct Answer: 3/8

Explanation:

n can take four different values, each of which can be combined with the four possible values for p. This gives us 16 possible pairs.

Now find out how many of these pairs can give a value for n/2p which is in set P.

If n = 12 and p = 2 the expression gives 12/4 = 3 which is in set P. Similarly n=12 and p = 3 works out to 2, which is in the set.

With n = 18, p can be 3. With n = 2, p can be 1. With n = 6, p can be 1, or 3

This gives us 6 pairs out of 16 = 3/8

10.Correct Answer: 54

Explanation:

First find n by finding f(3);

$f(3) = (12-3)^{3/2} = 9^{3/2} = \sqrt{9^3} = \sqrt{(9x9x9)} = \sqrt{9} \times \sqrt{9} \times \sqrt{9} = 27$

But we are asked for 2n; 2n = 54