



Permutations Ex 16.3 Q30

The even number so last digit must be even. We can so number patterns are

- 1) odd, odd, even
- 2) odd, even, even
- 3) even, odd, even
- 4) even, even, even

For the pattern 1 - number of ways of choosing 1st digit is 3
2nd digit (already one is gone) is 2
3rd is 3

Therefore, the no of ways is $3 \times 2 \times 3$.

Similarly for pattern 2, the no. of ways is $3 \times 3 \times 2$

for pattern 3, the no. of ways is $3 \times 3 \times 2$

for pattern 4, the no. of ways is $3 \times 2 \times 1$

Total no of ways is $3 \times 2 \times 3 + 3 \times 3 \times 2 + 3 \times 3 \times 2 + 3 \times 2 \times 1$
 $18 \times 3 + 6 = 60$

Permutations Ex 16.3 Q31

We can take the digits one at a time, starting at either end.

Let's start from the right.

d c b a = the digits to be chosen.

For a we have 5 choices (1,2,3,4,5)

For b we only have 4 (having used one for a, and repeats not allowed)

For c we have 3

For d we have 2.

$5 * 4 * 3 * 2 = 120$ choices overall

If we want the number to be even,

we don't have 5 choices for a, we are limited to the set {2, 4}

there are only two digits available.

But for the remaining digits the calculation is the same.

$\frac{2}{5}$ of the numbers are even $= \frac{2}{5} \times 120 = 48 = 2 \times 4 \times 3 \times 2$

Permutations Ex 16.3 Q32

There are 6 letters in the word 'EAMCOT'. Out of these letters 'E', 'A' and 'O' are the three vowels.

The remaining three consonants can be arranged in 3P_3 ways. In each of these arrangements 4 places are created, shown by the cross marks.

×	V	×	V	×	V	×
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Since no two vowels are to be placed adjacent to each other, so we may arrange 3 vowels in 4 places in 4P_3 ways.

The total number of arrangements

$$= {}^3P_3 \times {}^4P_3$$

$$= 3! \times 4!$$

$$= 144$$

***** END *****