**1.** Tracey is going to choose a main course and a dessert in a cafe.
She can choose from 8 main courses and 7 desserts.

Tracey says that to work out the number of different ways of choosing a main course and a dessert you add 8 and 7

(a) Is Tracey correct?
You must give a reason for your answer.

No, because Tracey should multiply 8 and 7, rather than add ✓

**(1)**

12 teams play in a competition.
Each team plays each other team exactly once.

(b) Work out the total number of games played.

Each team plays 11 games

$12 \times 11 = 132$ ✓

$(\div 2)$

$= 66$

66 ✓

**(2)**

$(x-2)^2 = 3$

$\sqrt{\quad} \quad \sqrt{\quad}$

$x - 2 = \pm\sqrt{3}$

$(+2) \quad (+2)$

$x = 2 \pm \sqrt{3}$

$\therefore x = 2 + \sqrt{3} = 3.732\ldots$

$x = 2 - \sqrt{3} = 0.2679\ldots$

3.73 , 0.27 ✓

**2.** There are 16 hockey teams in a league.
Each team played two matches against each of the other teams.

Work out the total number of matches played.

Each team plays 15 other teams twice

A vs B is the same as B vs A, so should only be included once
Therefore the final answer should be divided by 2 to account for duplicates.

Number of teams × (matches) Number of Other teams × "twice"

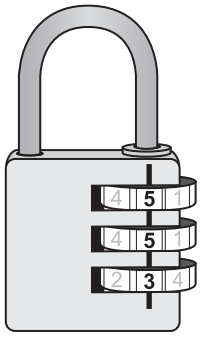
$16 \times 15 \times 2 = 480$

$480 \div 2 = 240$

240

**(Total for Question is 2 marks)**

**3.** There are three dials on a combination lock.
Each dial can be set to one of the numbers 1, 2, 3, 4, 5
The three digit number 553 is one way the dials can be set, as shown in the diagram.




(a) Work out the number of different three digit numbers that can be set for the combination lock.

DIGIT 1 □ 1, 2, 3, 4, 5 ⟶ 5 POSSIBLE DIGITS
DIGIT 2 □ 1, 2, 3, 4, 5 ⟶ 5 POSSIBLE DIGITS
DIGIT 3 □ 1, 2, 3, 4, 5 ⟶ 5 POSSIBLE DIGITS

∴ number of three-digit numbers
$= 5 \times 5 \times 5 = 125$ (1)

125 (1)

**(2)**

(b) How many of the possible three digit numbers have three different digits?

DIGIT 1 □ 1, 2, 3, 4, 5 ⟶ 5 POSSIBLE DIGITS
DIGIT 2 □ 2, 3, 4, 5 ⟶ 4 POSSIBLE DIGITS
DIGIT 3 □ 3, 4, 5 ⟶ 3 POSSIBLE DIGITS

∴ number of three-digit numbers with three different digits =
$5 \times 4 \times 3 = 60$ (1)

60 (1)

**(2)**

**(Total for Question is 4 marks)**

**4.** Sadia is going to buy a new car.
For the car, she can choose one body colour, one roof colour and one wheel type.

She can choose from

19 different body colours
25 different wheel types
x different roof colours

The total number of ways Sadia can choose the body colour and the roof colour and the wheel type is 3325

Work out the number of different roof colours that Sadia can choose from.

$\frac{19 \times 25 \times x}{19 \times 25} = \frac{3325}{19 \times 25}$ (1)

$x = \frac{3325}{475} = 7$

(1) 7

$(3x+2)(2x+1)(x-5)$ (1)

$(6x^2+3x+4x+2)(x-5)$

$(6x^2+7x+2)(x-5)$ (1)

$6x^3+7x^2+2x-30x^2-35x-10$

$6x^3-23x^2-33x-10$

(1) $6x^3-23x^2-33x-10$

**5.** Jack is in a restaurant.
There are 5 starters, 8 main courses and some desserts on the menu.

Jack is going to choose one starter, one main course and one dessert.
He says there are 240 ways that he can choose his starter, his main course and his dessert.

Could Jack be correct?
You must show how you get your answer.

To get 240 choices, $5 \times 8 \times x = 240$

$\div 40$ ( $40x = 240$ ) $\div 40$

$x = 6$

Yes, as long as there are 6 desserts, which is reasonable.

**(Total for Question 11 is 2 marks)**

**6.** In a school there are 16 teachers and 220 students.
Of these students 120 are girls and 100 are boys.

One teacher, one girl and one boy are going to be chosen to represent the school.

Work out the number of different ways there are to choose one teacher, one girl and one boy.

$16 \times 120 \times 100 = 192000$ (1)

192000 (1)