

Calculating the angle to draw a pie chart - (non-calculator)

Exercise A

The results of some 'favourite' surveys are shown on the tables below.
Find the size of the angles needed to draw a pie chart.

- Find the sum of the frequencies
- Calculate the multiplier needed to turn this into 360° using the calculation:

$$\text{Multiplier} = \frac{360}{\text{sum of frequencies}}$$

- Multiply each frequency by the multiplier

1.	Football team	Leicester	Man U	Everton	Liverpool	Aston Villa
	Frequency	40	60	30	40	10
	Angle					

2.	Sport	Football	Cricket	Tennis	Athletics	Baseball
	Frequency	45	15	20	4	6
	Angle					

3.	Subject	History	Maths	English	Art	Science
	Frequency	9	16	8	12	15
	Angle					

4.	Pet	Dog	Cat	Hamster	Fish	Bird
	Frequency	7	12	9	6	2
	Angle					

5.	Fruit	Apple	Orange	Grape	Banana	Pear
	Frequency	48	33	21	11	7
	Angle					

6.	Supermarket	Tesco	Aldi	Lidl	Asda	Coop
	Frequency	9	11	13	7	5
	Angle					

7.	Snack	Crisps	Biscuits	Fruit	Chocolate	Nuts
	Frequency	9	5	7	3	6
	Angle					

8.	Colour	Red	Blue	Green	Yellow	Purple
	Frequency	18	25	12	10	7
	Angle					

9.	Type of car	BMW	Honda	Nissan	Toyota	Audi
	Frequency	240	50	180	90	160
	Angle					

10.	Washing powder	Daz	Bold	Ariel	Surf	Other
	Frequency	6	5	2	4	1
	Angle					

11.	Nut	Peanut	Brazil	Walnut	Cashew	Almond
	Frequency	60	40	70	20	50
	Angle					

12.	Crisps	Salted	Vinegar	Cheese	Beef	Chicken
	Frequency	16	18	26	8	12
	Angle					

Calculating the frequency from the angle of a pie chart

Exercise B

Find the frequency of each item from the pie chart angle

- Find the proportion the total frequency is of the whole 360° (Find a simplified fraction)
- Multiply each angle by this fraction

1.	Sport	Football	Rugby	Cricket	Golf	Hockey	Total
	Frequency						90
	Angle	120°	36°	60°	80°	64°	

2.	Phone	Nokia	Samsung	Microsoft	Apple	Other	Total
	Frequency						60
	Angle	180°	72°	48°	24°	36°	

3.	Chocolate bar	Mars	Snickers	Bounty	Malteser	Crunchie	Total
	Frequency						72
	Angle	45°	90°	30°	75°	120°	

4.	Holiday	Europe	Asia	UK	USA	Other	Total
	Frequency						45
	Angle	160°	56°	24°	40°	80°	

5.	Airline	Easyjet	Jet2	TUI	Flybe	Wizz	Total
	Frequency						240
	Angle	30°	90°	18°	72°	150°	

Calculating the angle to draw a pie chart - (calculator)

Exercise C

The results of some 'favourite' surveys are shown on the tables below.

Find the size of the angles needed to draw a pie chart. Round your answers to the nearest degree if appropriate.

- Find the total of the frequencies
- Find the proportion that each frequency is of the total frequencies (Find the fraction)
- Multiply this fraction by 360

1.	London teams	Arsenal	West Ham	QPR	Chelsea	Crystal Palace
	Frequency	60	40	22	12	10
	Angle					

2.	Olympic Sport	Archery	Diving	Athletics	Rowing	Swimming
	Frequency	40	70	30	15	45
	Angle					

3.	Ball games	Volleyball	Baseball	Basketball	Handball	Football
	Frequency	54	110	40	72	24
	Angle					

4.	Vegetable	Carrot	Onion	Parsnip	Cabbage	Broccoli
	Frequency	210	40	28	72	150
	Angle					

5.	Garden birds	Thrush	Robin	Bluetit	Blackbird	Sparrow
	Frequency	18	15	31	52	34
	Angle					

6.	Chocolate	Twirl	Boost	CDM	Picnic	KitKat
	Frequency	2	1	8	5	12
	Angle					

7.	Sport	Badminton	Tennis	Squash	Cricket	Snooker
	Frequency	46	25	38	62	79
	Angle					

8.	Olympic Sport	Bobsleigh	Skating	Luge	Skiing	Curling
	Frequency	58	32	18	56	11
	Angle					

Answers

Exercise A

1.	Football team	Leicester	Man U	Everton	Liverpool	Aston Villa	
	Frequency	40	60	30	40	10	(180)
	Angle	80°	120°	60°	80°	20°	(x 2)
2.	Sport	Football	Cricket	Tennis	Athletics	Baseball	
	Frequency	45	15	20	4	6	(90)
	Angle	180°	60°	80°	16°	24°	(x 4)
3.	Subject	History	Maths	English	Art	Science	
	Frequency	9	16	8	12	15	(60)
	Angle	54°	96°	48°	72°	90°	(x 6)
4.	Pet	Dog	Cat	Hamster	Fish	Bird	
	Frequency	7	12	9	6	2	(36)
	Angle	70°	120°	90°	60°	20°	(x 10)
5.	Fruit	Apple	Orange	Grape	Banana	Pear	
	Frequency	48	33	21	11	7	(120)
	Angle	144°	99°	63°	33°	21°	(x 3)
6.	Supermarket	Tesco	Aldi	Lidl	Asda	Coop	
	Frequency	9	11	13	7	5	(45)
	Angle	72°	88°	104°	56°	40°	(x 8)
7.	Snack	Crisps	Biscuits	Fruit	Chocolate	Nuts	
	Frequency	9	5	7	3	6	(30)
	Angle	108°	60°	84°	36°	72°	(x 12)
8.	Colour	Red	Blue	Green	Yellow	Purple	
	Frequency	18	25	12	10	7	(72)
	Angle	90°	125°	60°	50°	35°	(x 5)
9.	Type of car	BMW	Honda	Nissan	Toyota	Audi	
	Frequency	240	50	180	90	160	(720)
	Angle	120°	25°	90°	45°	80°	(x 1/2)
10.	Washing Powder	Daz	Bold	Ariel	Surf	Other	
	Frequency	6	5	2	4	1	(18)
	Angle	120°	100°	40°	80	20°	(x 20)
11.	Nut	Peanut	Brazil	Walnut	Cashew	Almond	
	Frequency	60	40	70	20	50	(240)
	Angle	90°	60°	105°	30°	75°	(x 3/2)
12.	Crisps	Salted	Vinegar	Cheese	Beef	Chicken	
	Frequency	16	18	26	8	12	(80)
	Angle	72°	81°	117°	36°	54°	(x 9/2)

Exercise B

1.	Sport	Football	Rugby	Cricket	Golf	Hockey	Total
	Frequency	30	9	15	20	16	90
	Angle	120°	36°	60°	80°	64°	
2.	Phone	Nokia	Samsung	Microsoft	Apple	Other	Total
	Frequency	30	12	8	4	6	60
	Angle	180°	72°	48°	24°	36°	
3.	Chocolate bar	Mars	Snickers	Bounty	Malteser	Crunchie	Total
	Frequency	9	18	6	15	24	72
	Angle	45°	90°	30°	75°	120°	
4.	Holiday	Europe	Asia	UK	USA	Other	Total
	Frequency	20	7	3	5	10	45
	Angle	160°	56°	24°	40°	80°	
5.	Airline	Easyjet	Jet2	TUI	Flybe	Wizz	Total
	Frequency	20	60	12	48	100	240
	Angle	30°	90°	18°	72°	150°	

Exercise C

1.	London teams	Arsenal	West Ham	QPR	Chelsea	Crystal Palace
	Frequency	60	40	22	12	10
	Angle	150°	100°	55°	30°	25°
2.	Olympic Sport	Archery	Diving	Athletics	Rowing	Swimming
	Frequency	40	70	30	15	45
	Angle	72°	126°	54°	27°	81°
3.	Ball games	Volleyball	Baseball	Basketball	Handball	Football
	Frequency	54	110	40	72	24
	Angle	(64.8) 65°	132°	48°	(86.4) 86°	(28.8) 29°
4.	Vegetable	Carrot	Onion	Parsnip	Cabbage	Broccoli
	Frequency	210	40	28	72	150
	Angle	(151.2) 151°	(28.8) 29°	(20.16) 20°	(51.84) 52°	108°
5.	Garden birds	Thrush	Robin	Bluetit	Blackbird	Sparrow
	Frequency	18	15	31	52	34
	Angle	(43.2) 43°	36°	(74.4) 74°	(124.8) 125°	(81.6) 82°
6.	Chocolate	Twirl	Boost	CDM	Picnic	KitKat
	Frequency	2	1	8	5	12
	Angle	(25.7) 26°	(12.9) 13°	(102.9) 103°	(64.3) 64°	(154.3) 154°
7.	Sport	Badminton	Tennis	Squash	Cricket	Snooker
	Frequency	46	25	38	62	79
	Angle	(66.24) 66°	36°	(54.72) 55°	(89.28) 89°	(113.8) 114°
8.	Olympic Sport	Bobsleigh	Skating	Luge	Skiing	Curling
	Frequency	58	32	18	56	11
	Angle	(119.3) 119°	(65.83) 66°	(37.02) 37°	(115.2) 115°	(22.6) 23°