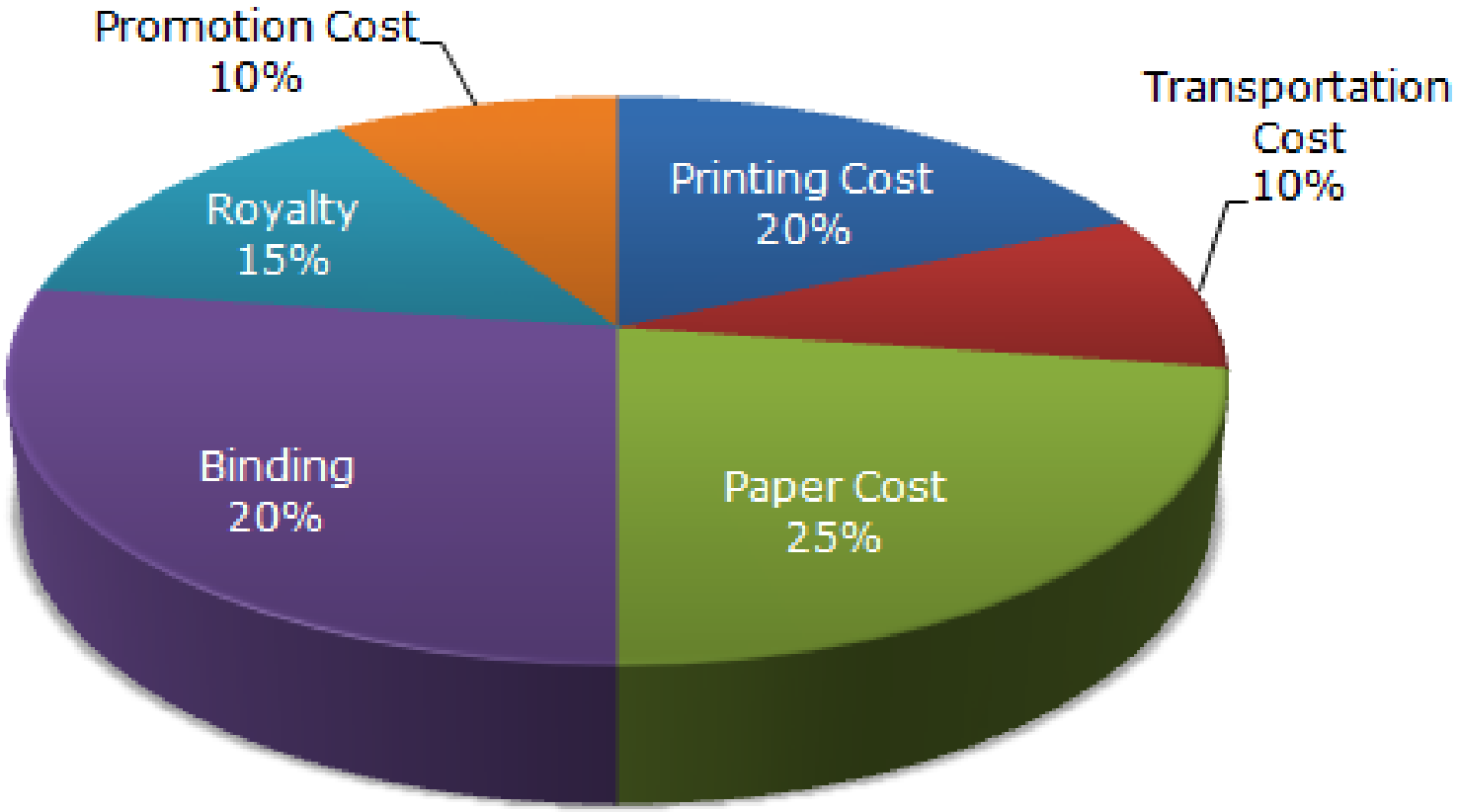
Data Interpretation

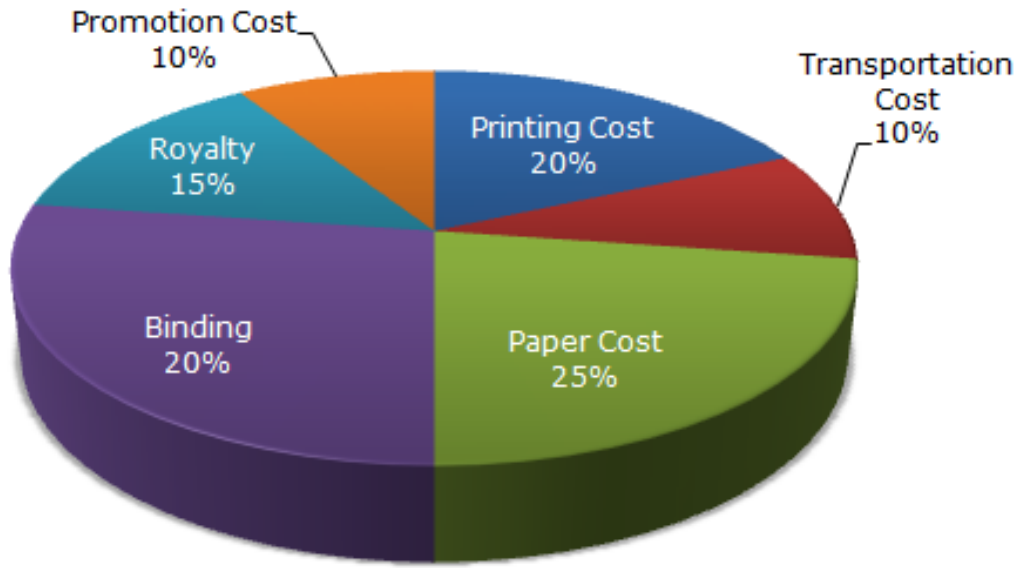
Tabulation, Pie and Bar Diagram

The following pie-chart shows the percentage distribution of the expenditure incurred in publishing a book. Study the pie-chart and the answer the questions based on it.

Various Expenditures (in percentage) Incurred in Publishing a Book



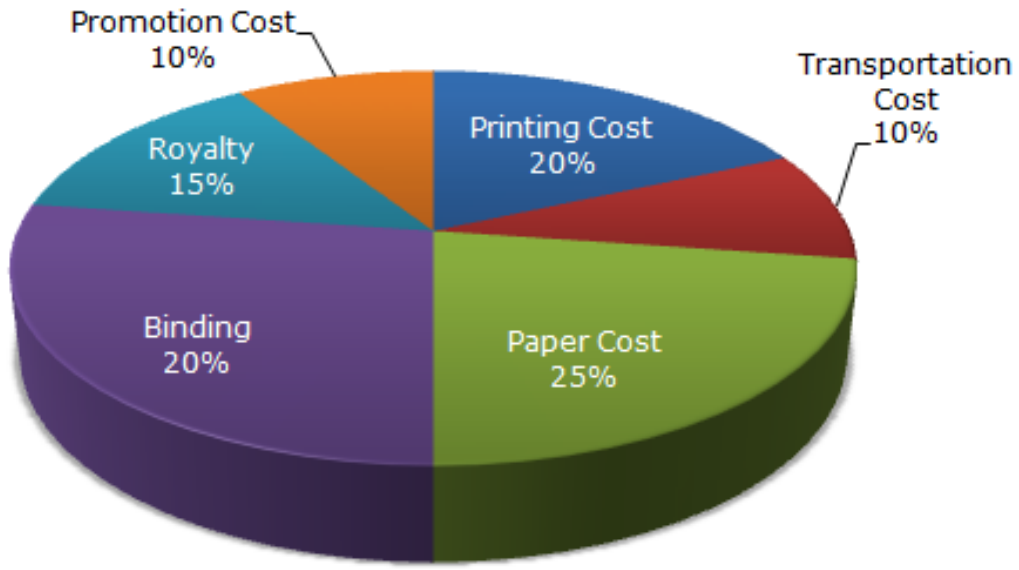
1. If for a certain quantity of books, the publisher has to pay Rs. 30,600 as printing cost, then what will be amount of royalty to be paid for these books?



Let the amount of Royalty to be paid for these books be Rs. r.

Then, $20 : 15 = 30600 : r \quad \Rightarrow \quad r = \text{Rs.} \left(\frac{30600 \times 15}{20} \right) = \text{Rs. } 22{,}950.$

2. What is the central angle of the sector corresponding to the expenditure incurred on Royalty?

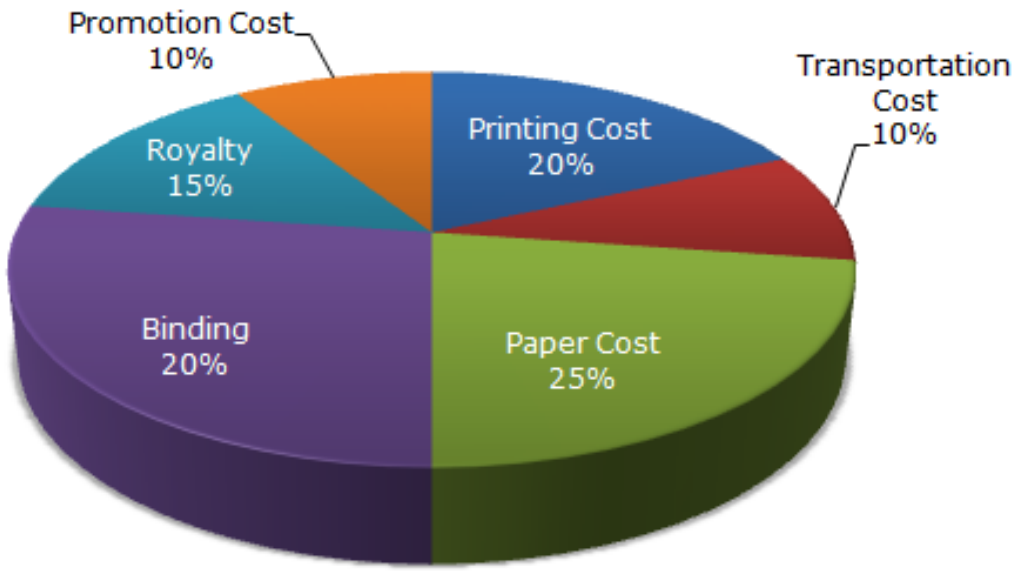


Central angle corresponding to Royalty = (15% of 360)°

$$= \left(\frac{15}{100} \times 360\right)^{\circ}$$

$$= 54°.$$

3. The price of the book is marked 20% above the C.P. If the marked price of the book is Rs. 180, then what is the cost of the paper used in a single copy of the book?



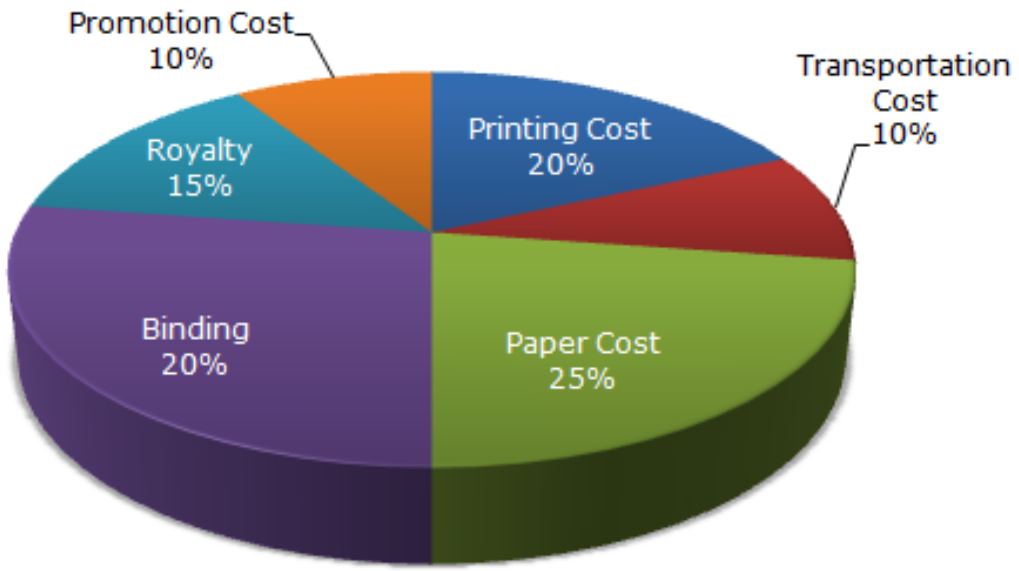
Clearly, marked price of the book = 120% of C.P.

Also, cost of paper = 25% of C.P

Let the cost of paper for a single book be Rs. n.

Then, $120 : 25 = 180 : n \quad \Rightarrow \quad n = \text{Rs.} \left(\frac{25 \times 180}{120}\right) = \text{Rs. } 37.50$.

4. If 5500 copies are published and the transportation cost on them amounts to Rs. 82500, then what should be the selling price of the book so that the publisher can earn a profit of 25%?



For the publisher to earn a profit of 25%, S.P. = 125% of C.P.

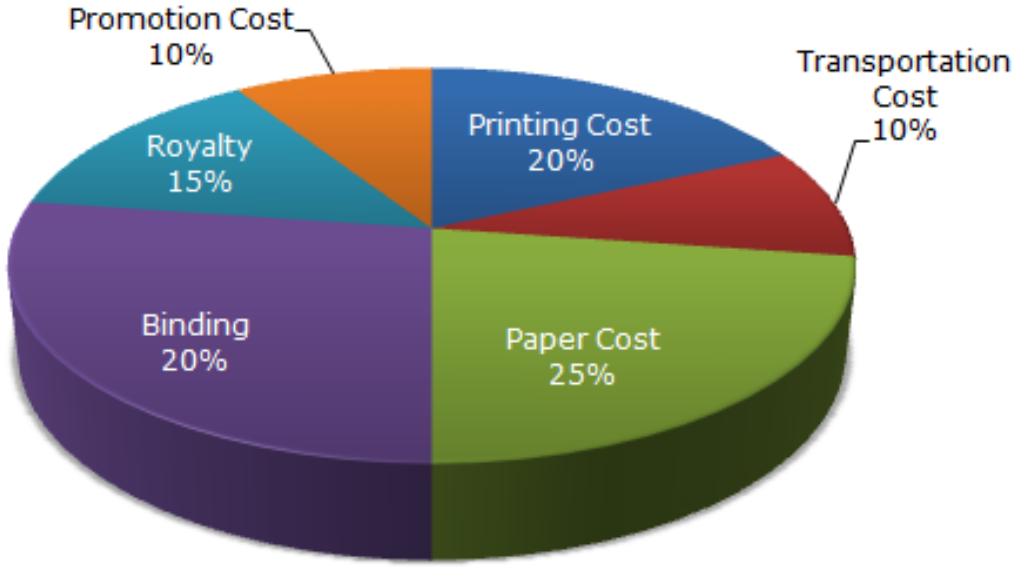
Also Transportation Cost = 10% of C.P.

Let the S.P. of 5500 books be Rs. x.

Then, $10 : 125 = 82500 : x \quad \Rightarrow \quad x = \text{Rs.} \left(\frac{125 \times 82500}{10}\right) = \text{Rs. } 1031250.$

$\therefore$ S.P. of one book = Rs. $\left(\frac{1031250}{5500}\right)$ = Rs. 187.50 .

5. If for an edition of the book, the cost of paper is ₹56250, then find the promotion cost for this edition.

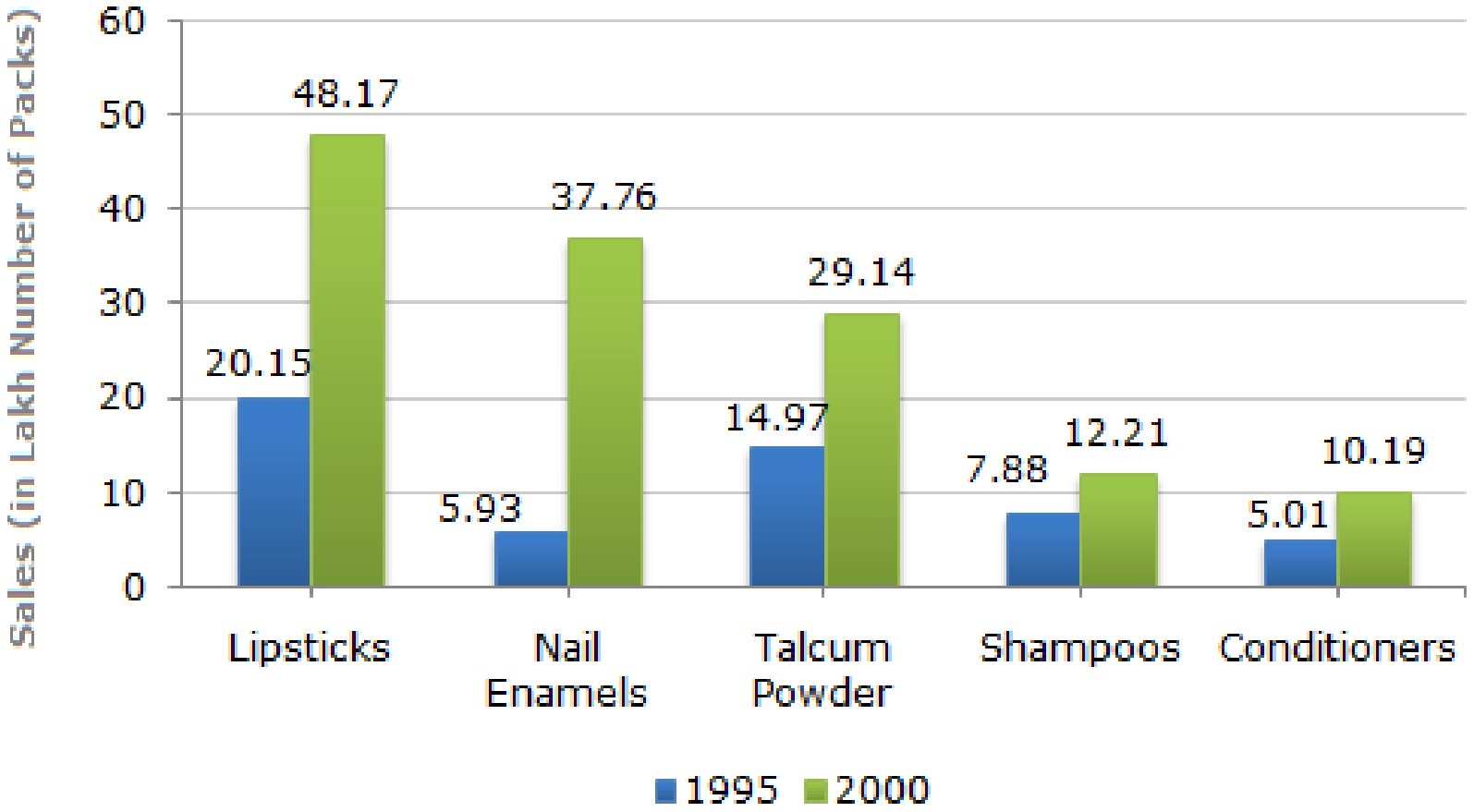


Let the Promotion Cost for this edition be Rs. p.

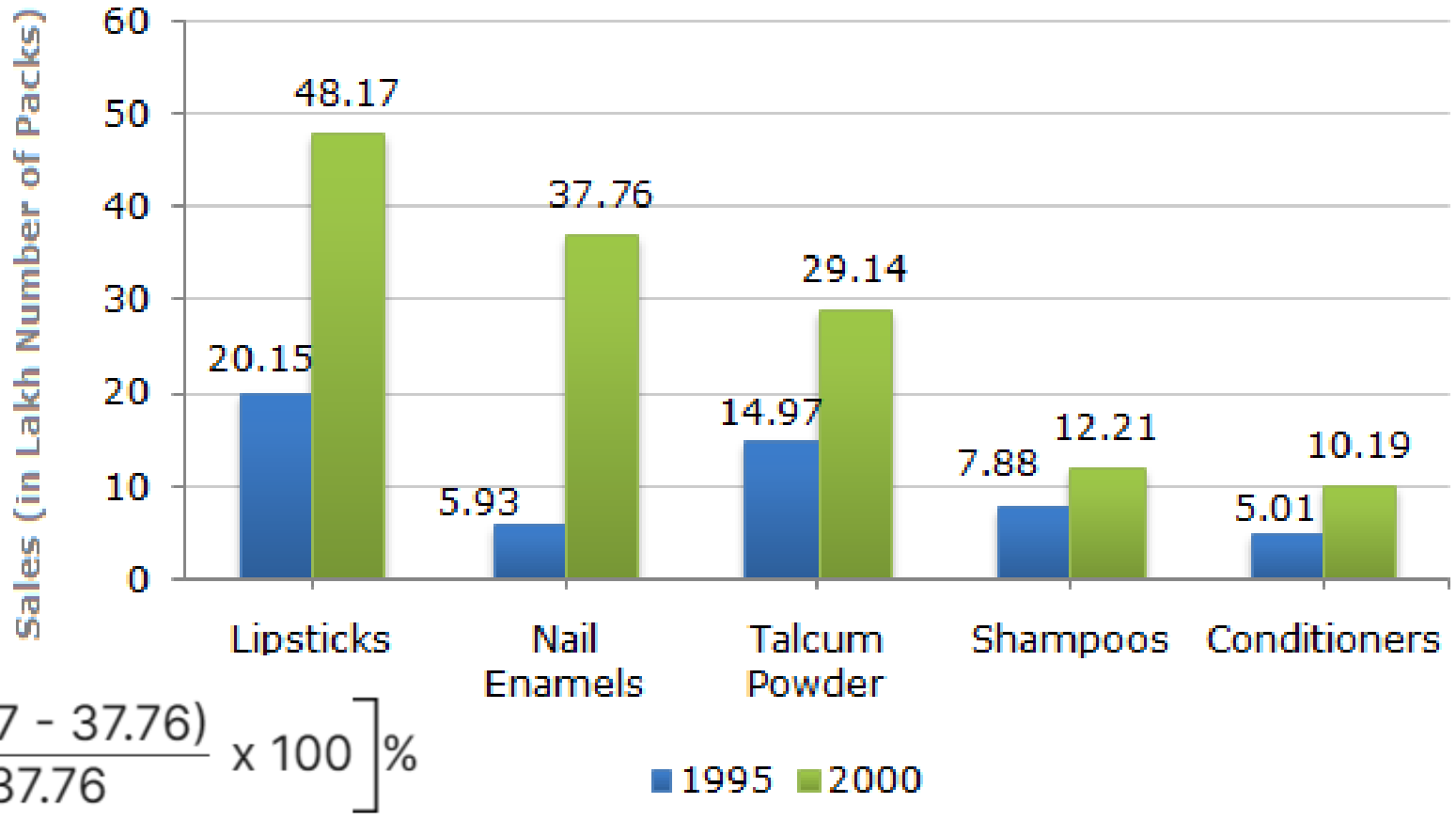
Then, $25 : 10 = 56250 : p \Rightarrow p = \text{Rs.}\left(\frac{56250 \times 10}{25}\right) = \text{Rs. } 22,500$

A cosmetic company provides five different products. The sales of these five products (in lakh number of packs) during 1995 and 2000 are shown in the following bar graph.

Sales (in lakh number of packs) of five different products of Cosmetic Company during 1995 and 2000



The sales of lipsticks in 2000 was by what percent more than the sales of nail enamels in 2000? (rounded off to nearest integer)

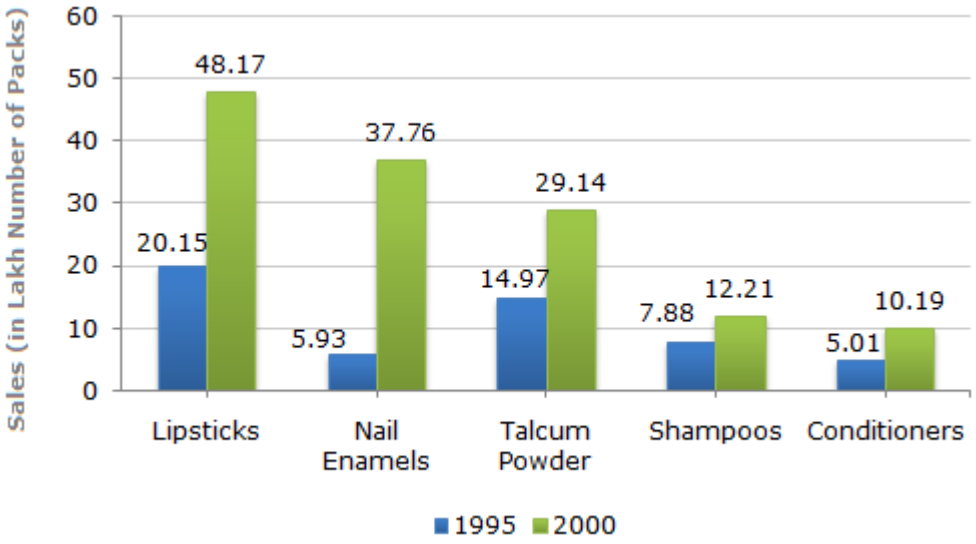


$$\text{Required percentage} = \left[\frac{(48.17 - 37.76)}{37.76} \times 100\right]\%$$

$$= 27.57\%$$

$$\approx 28\%.$$

During the period 1995-2000, the minimum rate of increase in sales is in the case of?



The percentage increase from 1995 to 2000 for various products are:

Lipsticks = $\left[\frac{(48.17 - 20.15)}{20.15} \times 100\right]\% = 139.06\%$.

Nail enamels = $\left[\frac{(37.76 - 5.93)}{5.93} \times 100\right]\% = 536.76\%$.

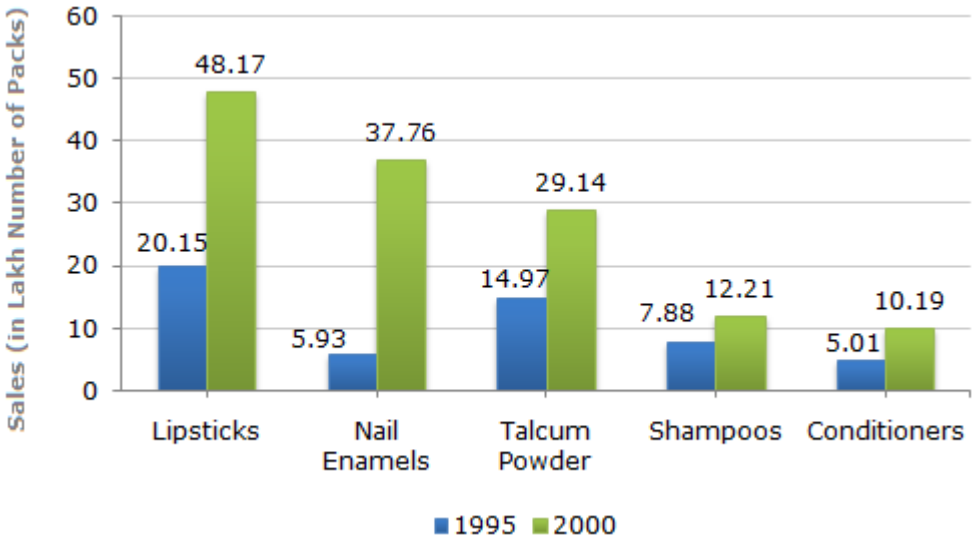
Talcum powders = $\left[\frac{(29.14 - 14.97)}{14.97} \times 100\right]\% = 94.66\%$.

Shampoos = $\left[\frac{(12.21 - 7.88)}{7.88} \times 100\right]\% = 54.95\% \approx \mathbf{55\%}$.

Conditioners = $\left[\frac{(10.19 - 5.01)}{5.01} \times 100\right]\% = 103.39\%$.

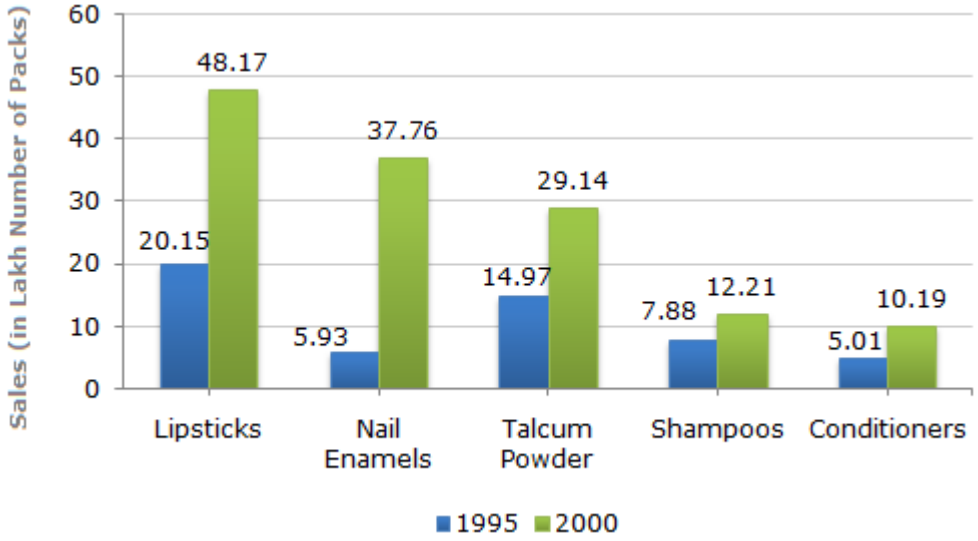
$\therefore$ The minimum rate of increase in sales from 1995 to 2000 is in the case of Shampoos.

What is the approximate ratio of the sales of nail enamels in 2000 to the sales of Talcum powders in 1995?



$$\text{Required ratio} = \frac{37.76}{14.97} \approx 2.5 = \frac{5}{2}.$$

The sales have increase by nearly 55% from 1995 to 2000 in the case of?



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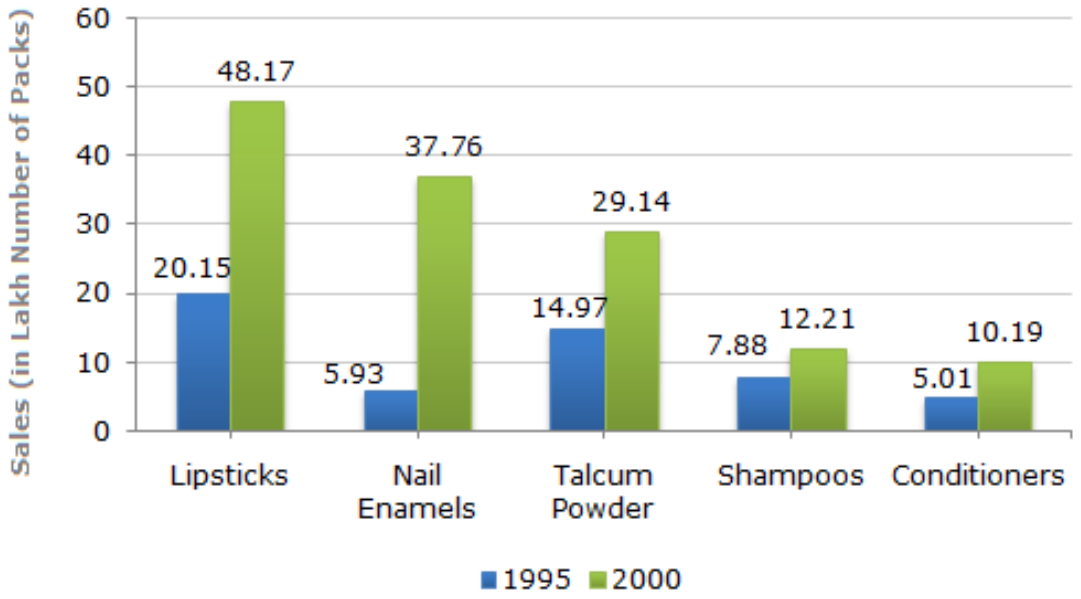
The sales of conditioners in 1995 was by what percent less than the sales of shampoos in 1995? (rounded off to nearest integer)



$$\text{Required percentage} = \left[\frac{(7.88 - 5.01)}{7.88} \times 100\right]\%$$

$$= 36.42\%$$

$$\approx 36\%.$$

1. Study the following table and answer the questions based on it.
Expenditures of a Company (in Lakh Rupees) per Annum Over the given Years

Year	Item of Expenditure				
	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

i. What is the average amount of interest per year which the company had to pay during this period?

Rs. 32.43 lakhs b. Rs. 33.72 lakhs c. Rs. 34.18 lakhs d. Rs. 36.66 lakhs

Year	Item of Expenditure				
	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
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2002	420	142	3.96	49.4	98

Average amount of interest paid by the Company during the given period

$$= \text{Rs.} \left[\frac{23.4 + 32.5 + 41.6 + 36.4 + 49.4}{5}\right] \text{lakhs}$$

$$= \text{Rs.} \left[\frac{183.3}{5}\right] \text{lakhs}$$

= Rs. 36.66 lakhs.

ii. Calculate the approximate percentage of the total bonus payments in relation to the total salary amount over the given period.

a. 0.1% b. 0.5% c. 1% d. 1.25%

Year	Item of Expenditure				
	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

$$\text{Required percentage} = \left[\frac{(3.00 + 2.52 + 3.84 + 3.68 + 3.96)}{(288 + 342 + 324 + 336 + 420)} \times 100\right]\%$$

$$= \left[\frac{17}{1710} \times 100\right]\%$$

$$\approx 1\%.$$

iii. Estimate the percentage of the total expenditure on all these items in 1998 compared to the total expenditure in 2002.

62% b. 66% c. 69% d. 71%

Year	Item of Expenditure				
	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

$$\text{Required percentage} = \left[\frac{(288 + 98 + 3.00 + 23.4 + 83)}{(420 + 142 + 3.96 + 49.4 + 98)} \times 100\right]\%$$

$$= \left[\frac{495.4}{713.36} \times 100\right]\%$$

$$\approx 69.45\%.$$

iv. Calculate the total expenditure of the company on these items during the year 2000.

Rs. 544.44 lakhs b. Rs. 501.11 lakhs c. Rs. 446.46 lakhs d. Rs. 478.87 lakhs

Year	Item of Expenditure				
	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

Total expenditure of the Company during 2000
= Rs. (324 + 101 + 3.84 + 41.6 + 74) lakhs
= Rs. 544.44 lakhs.

v. Determine the approximate ratio of the total expenditure on Taxes to the total expenditure on Fuel and Transport across all the years.

4:7 b. 10:13 c. 15:18 d. 5:8

Year	Item of Expenditure				
	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

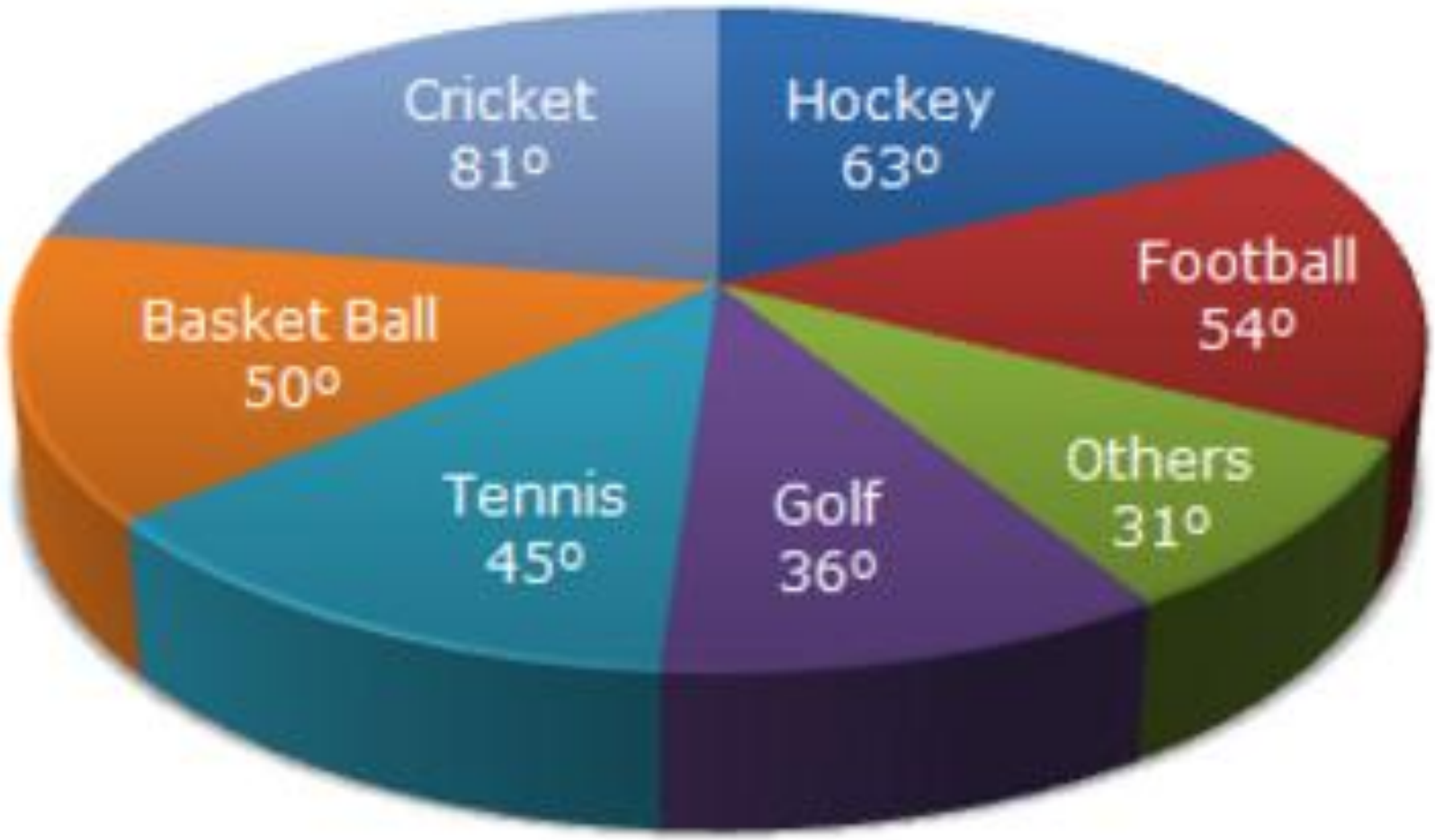
$$\text{Required ratio} = \left[\frac{(83 + 108 + 74 + 88 + 98)}{(98 + 112 + 101 + 133 + 142)}\right]$$

$$= \left[\frac{451}{586}\right]$$

$$= \frac{1}{1.3}$$

$$= \frac{10}{13}.$$

The circle-graph given here shows the spending of a country on various sports during a particular year. Study the graph carefully and answer the questions given below it.



Find the percentage of expenditure on Tennis over the total expenditure.

In the given pi-chart measure of central angle of tennis is 45°

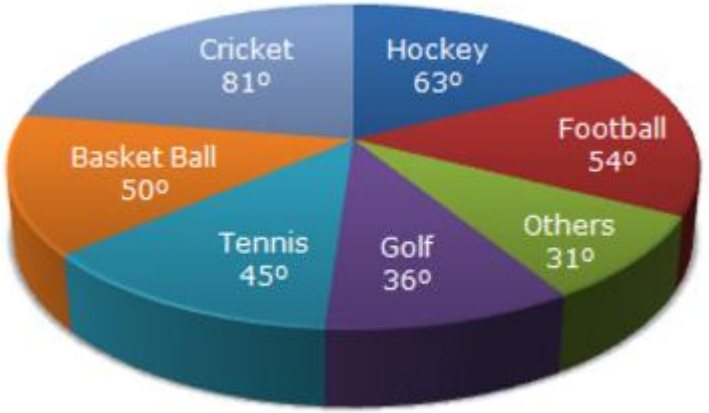
Measure of all central angles is 360°

Let S be the percentage of money spend on tennis

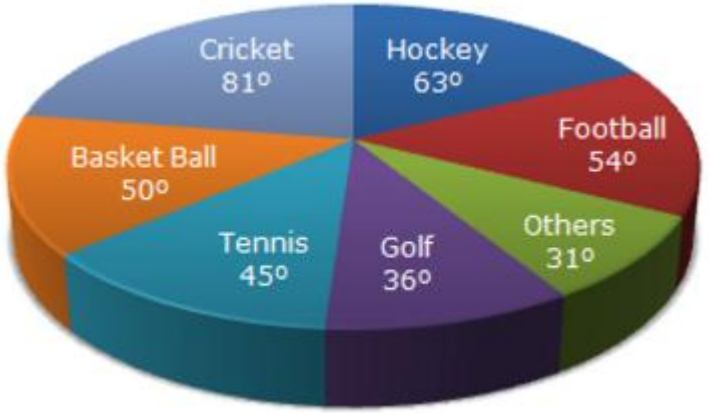
$$S = \left(\frac{45}{360} \times 100\right)\%$$

$$= \frac{5}{40} \times 100$$

$$= 12\frac{1}{2}$$



Find the percentage increase in expenditure on Hockey compared to that on Golf.



Let the total spendings on sports be Rs. x. Then,

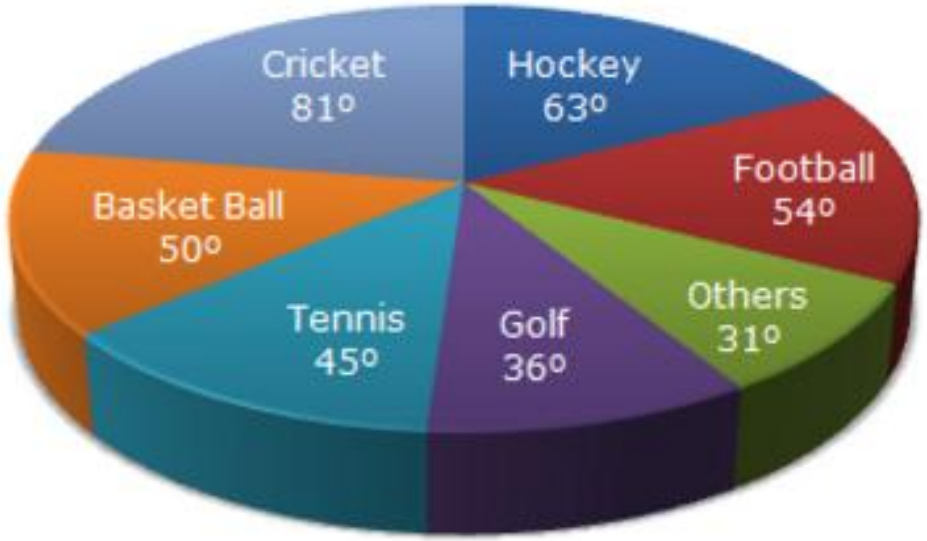
$$\text{Amount spent on Golf} = \text{Rs.}\left(\frac{36}{360} \times x\right) = \text{Rs.}\ \frac{x}{10}$$

$$\text{Amount spent on Hockey} = \text{Rs.}\left(\frac{63}{360} \times x\right) = \text{Rs.}\ \frac{7x}{40}$$

$$\text{Difference} = \text{Rs.}\left(\frac{7x}{40} - \frac{x}{10}\right) = \text{Rs.}\ \frac{3x}{40}$$

$$\therefore \text{Required percentage} = \text{Rs}\left[\left(\frac{3x/40}{x/10}\right) \times 100\right]\% = 75\%$$

Calculate the percentage decrease in expenditure on Football compared to that on Cricket.



Let the total spendings on sports be Rs. x. Then,

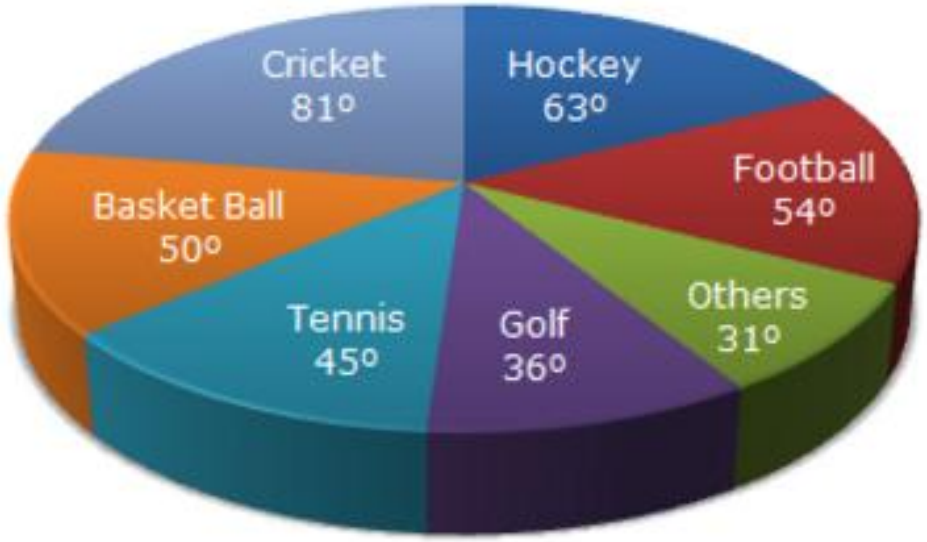
Amount spent on Cricket = Rs. $(\frac{81}{360} \times x) = \text{Rs. } \frac{9x}{40}$

Amount spent on Football = Rs. $(\frac{54}{360} \times x) = \text{Rs. } \frac{3x}{20}$

Difference = Rs $(\frac{9x}{40} - \frac{3x}{20}) = \text{Rs. } \frac{3x}{40}$

$\therefore$ Required percentage = Rs. $[(\frac{3x/40}{9x/40}) \times 100]\% = 33\frac{1}{3}\%$

If the total amount spent on sports during the year was ₹2 crores, then find the amount spent on Cricket and Hockey together.

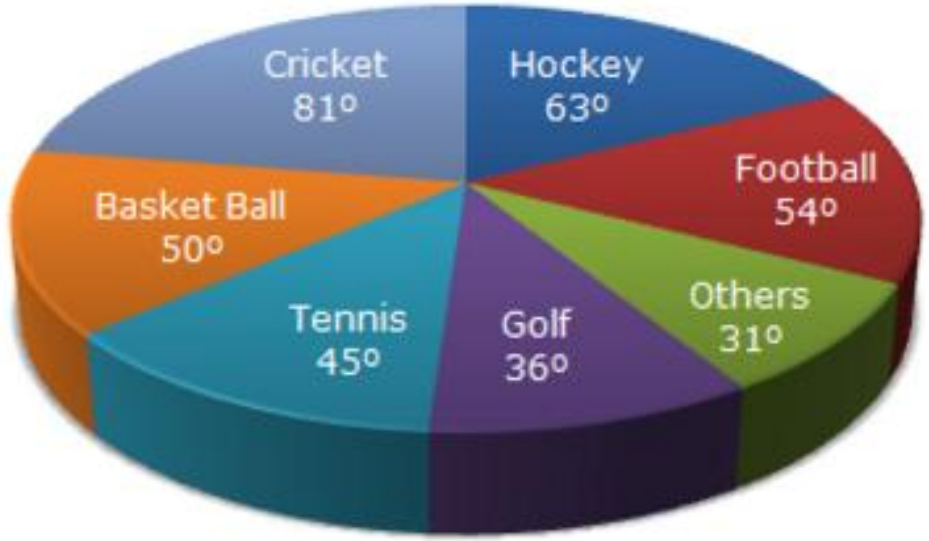


Amount spent on Cricket and Hockey together = Rs. $[\frac{(81+63)}{360} \times 2]$ crores

= Rs. 0.8crores

= Rs. 80, 00, 000.

If the total amount spent on sports during the year is ₹1,80,00,000, then find the amount spent on basketball that exceeds that on tennis.

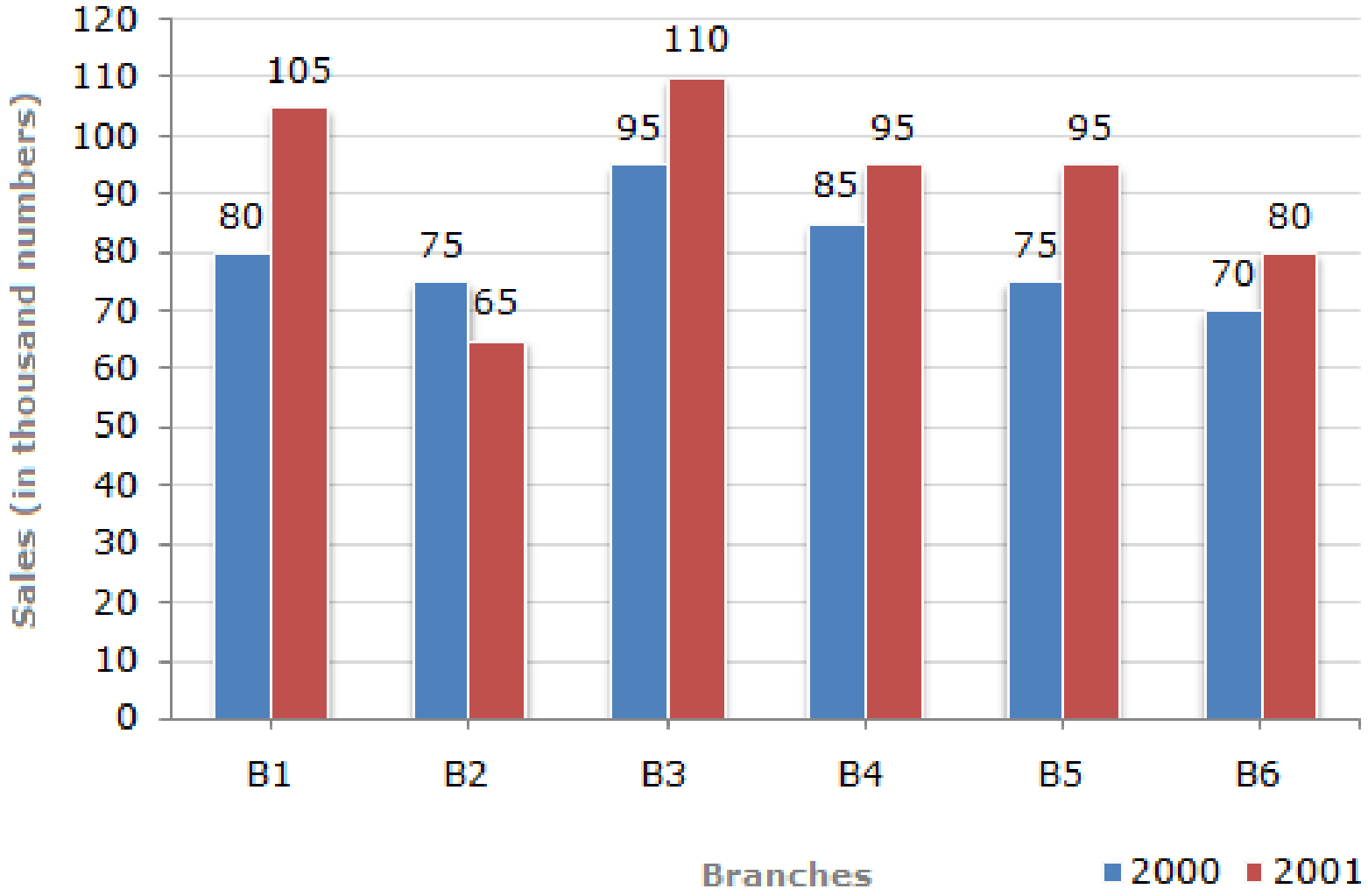


Amount spent on Basketball exceeds that on Tennis by:

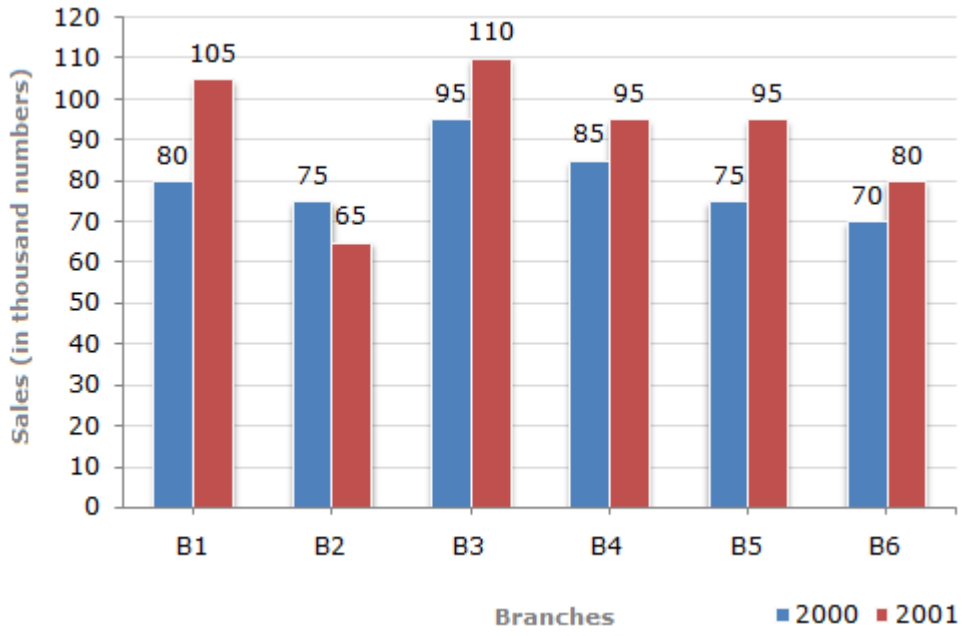
$$\text{Rs.}\left[\frac{(50-45)}{360}\times 18000000\right] = \text{Rs. } 250000$$

The bar graph given below shows the sales of books (in thousand number) from six branches of a publishing company during two consecutive years 2000 and 2001.

Sales of Books (in thousand numbers) from Six Branches - B1, B2, B3, B4, B5 and B6 of a publishing Company in 2000 and 2001.

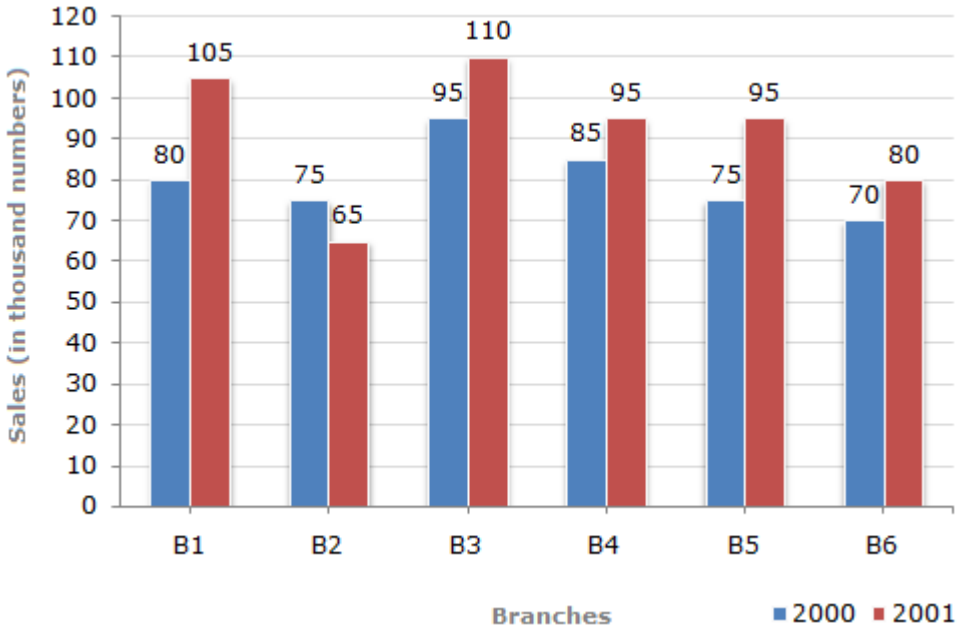


What is the ratio of the total sales of branch B2 for both years to the total sales of branch B4 for both years?



$$\text{Required ratio} = \frac{(75 + 65)}{(85 + 95)} = \frac{140}{180} = \frac{7}{9}.$$

Total sales of branch B6 for both the years is what percent of the total sales of branches B3 for both the years?

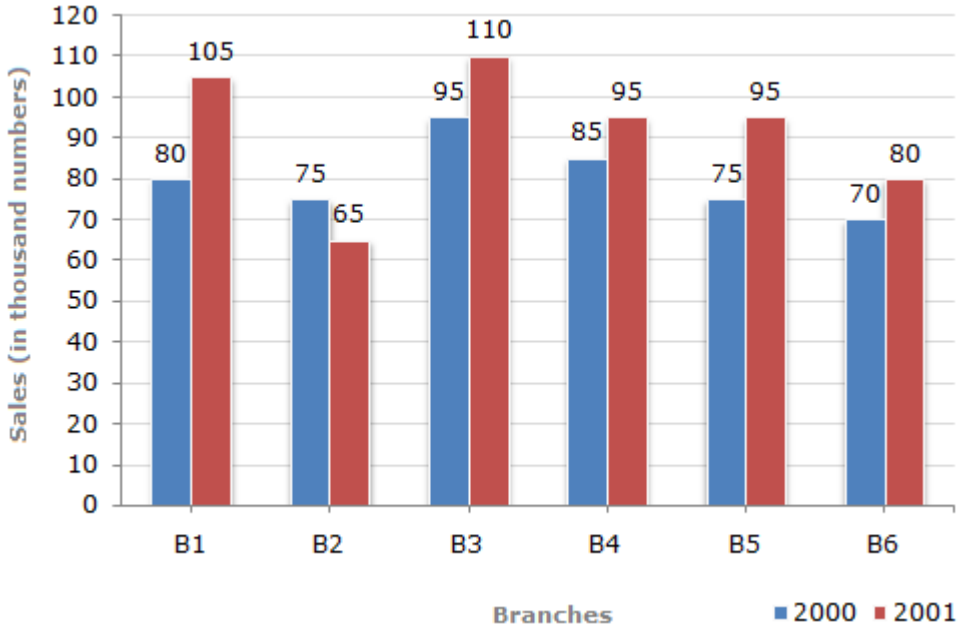


$$\text{Required percentage} = \left[\frac{(70 + 80)}{(95 + 110)} \times 100\right]\%$$

$$= \left[\frac{150}{205} \times 100\right]\%$$

$$= 73.17\%.$$

What percent of the average sales of branches B1, B2 and B3 in 2001 is the average sales of branches B1, B3 and B6 in 2000?



Average sales (in thousand number) of branches B1, B3 and B6 in 2000

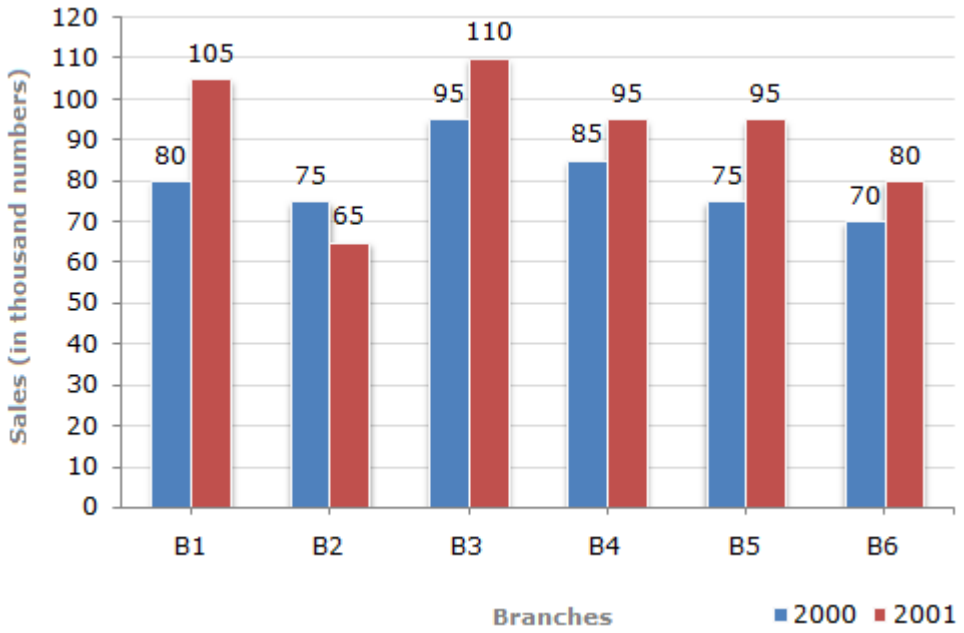
$$= \frac{1}{3} \times (80 + 95 + 70) = \left(\frac{245}{3}\right).$$

Average sales (in thousand number) of branches B1, B2 and B3 in 2001

$$= \frac{1}{3} \times (105 + 65 + 110) = \left(\frac{280}{3}\right).$$

$$\therefore \text{ Required percentage } = \left[\frac{245/3}{280/3} \times 100\right]\% = \left(\frac{245}{280} \times 100\right)\% = 87.5\%.$$

What is the average sales of all the branches (in thousand numbers) for the year 2000?

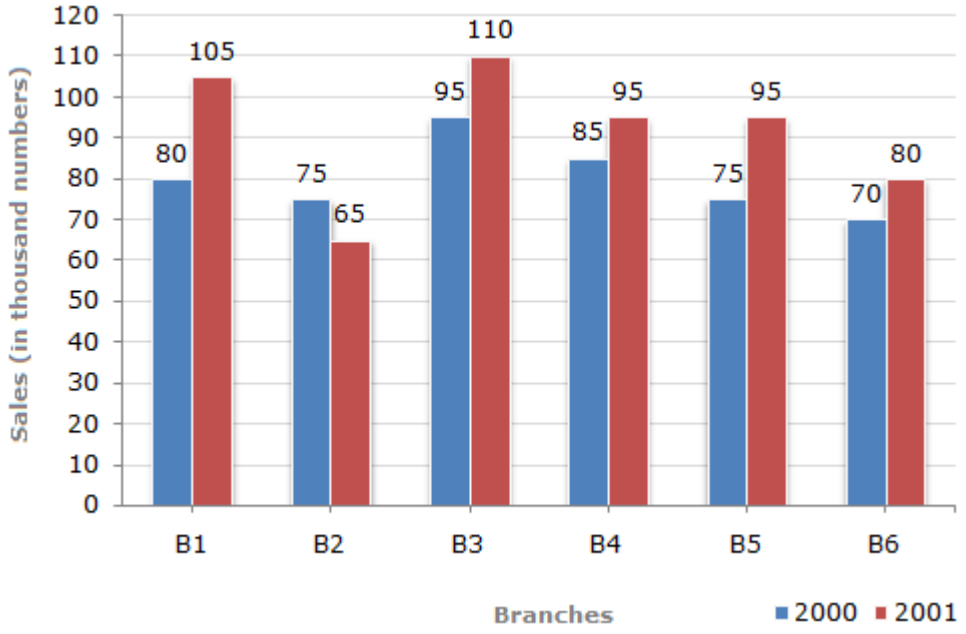


Average sales of all the six branches (in thousand numbers) for the year 2000

$$= \frac{1}{6} \times [80 + 75 + 95 + 85 + 75 + 70]$$

$$= 80.$$

Total sales of branches B1, B3 and B5 together for both the years (in thousand numbers) is?



Total sales of branches B1, B3 and B5 for both the years (in thousand numbers)

= (80 + 105) + (95 + 110) + (75 + 95)

= 560.

Study the following table and answer the questions given below it:

Number of students who go abroad for study from different states over the years

Year / State	1995	1996	1997	1998	1999
Maharashtra	723	840	900	920	925
Kerala	1035	940	1200	1400	1500
Karnataka	750	600	830	575	900
West Bengal	500	550	450	600	525
Delhi	1500	1625	1700	1475	1800
Andhra Pradesh	800	840	875	925	785

1. Find the state in which the least number of students go abroad over the years.
2. Find the year in which Kerala contribute approximately one-fifth of the total number of students in that year.
3. Find the state in which there is a continuous increase in the number of students over the given years.
4. Find the percentage increase in number of students from West Bengal from 1997 to 1998.
5. Find the percentage decrease in number of students from Andhra Pradesh from 1998 to 1999.

Year State	1995	1996	1997	1998	1999
Maharashtra	723	840	900	920	925
Kerala	1035	940	1200	1400	1500
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Identify the state with the least number of students going abroad over the years.

To find this, we sum up the total number of students for each state over the five years:

•Maharashtra: 723+840+900+920+925=4308723 + 840 + 900 + 920 + 925 = 4308

•Kerala: 1035+940+1200+1400+1500=60751035 + 940 + 1200 + 1400 + 1500 = 6075

•Karnataka: 750+600+830+575+900=3655750 + 600 + 830 + 575 + 900 = 3655

•West Bengal: 500+550+450+600+525=2625500 + 550 + 450 + 600 + 525 = 2625

•Delhi: 1500+1625+1700+1475+1800=81001500 + 1625 + 1700 + 1475 + 1800 = 8100

•Andhra Pradesh: 800+840+875+925+785=4225800 + 840 + 875 + 925 + 785 = 4225

West Bengal has the least number of students going abroad over the five years, with a total of 2625 students.

Determine the year in which Kerala contributed approximately one-fifth of the total number of students in that year.

We'll calculate the total number of students each year and see when Kerala's contribution is about 20% (one-fifth):

•1995: 723+1035+750+500+1500+800=5308723 + 1035 + 750 + 500 + 1500 + 800 = 5308 (Kerala: 1035 / 5308 ≈ 19.5%)

•1996: 840+940+600+550+1625+840=5395840 + 940 + 600 + 550 + 1625 + 840 = 5395 (Kerala: 940 / 5395 ≈ 17.4%)

•1997: 900+1200+830+450+1700+875=5955900 + 1200 + 830 + 450 + 1700 + 875 = 5955 (Kerala: 1200 / 5955 ≈ 20.1%)

•1998: 920+1400+575+600+1475+925=5895920 + 1400 + 575 + 600 + 1475 + 925 = 5895 (Kerala: 1400 / 5895 ≈ 23.7%)

•1999: 925+1500+900+525+1800+785=6435925 + 1500 + 900 + 525 + 1800 + 785 = 6435 (Kerala: 1500 / 6435 ≈ 23.3%)

Kerala contributed approximately one-fifth of the total number of students in the year 1997.

Year State	1995	1996	1997	1998	1999
Maharashtra	723	840	900	920	925
Kerala	1035	940	1200	1400	1500
Karnataka	750	600	830	575	900
West Bengal	500	550	450	600	525
Delhi	1500	1625	1700	1475	1800
Andhra Pradesh	800	840	875	925	785

Identify the state where there is a continuous increase in the number of students over the given years.

Reviewing the numbers, we find Maharashtra shows a continuous increase:

•Maharashtra: 723 → 840 → 900 → 920 → 925

(iv) **Calculate the percentage increase in the number of students from West Bengal from 1997 to 1998.**

Percentage increase = $\frac{(NewNumber - OriginalNumber)}{OriginalNumber} \times 100$

For West Bengal from 1997 to 1998:

$$\text{Percentage increase} = \frac{(600 - 450)}{450} \times 100 = \frac{150}{450} \times 100 \approx 33.33\%$$

(v) **Calculate the percentage decrease in the number of students from Andhra Pradesh from 1998 to 1999.**

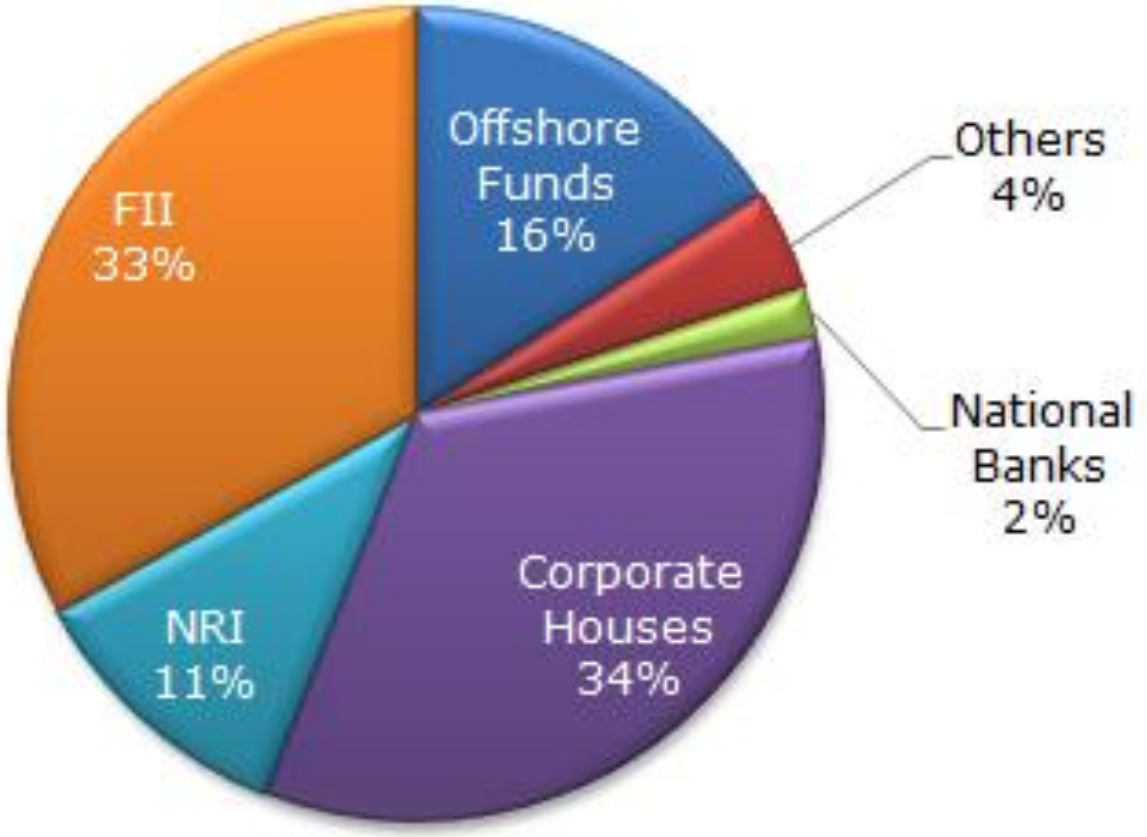
Percentage decrease = $\frac{(OriginalNumber - NewNumber)}{OriginalNumber} \times 100$

For Andhra Pradesh from 1998 to 1999:

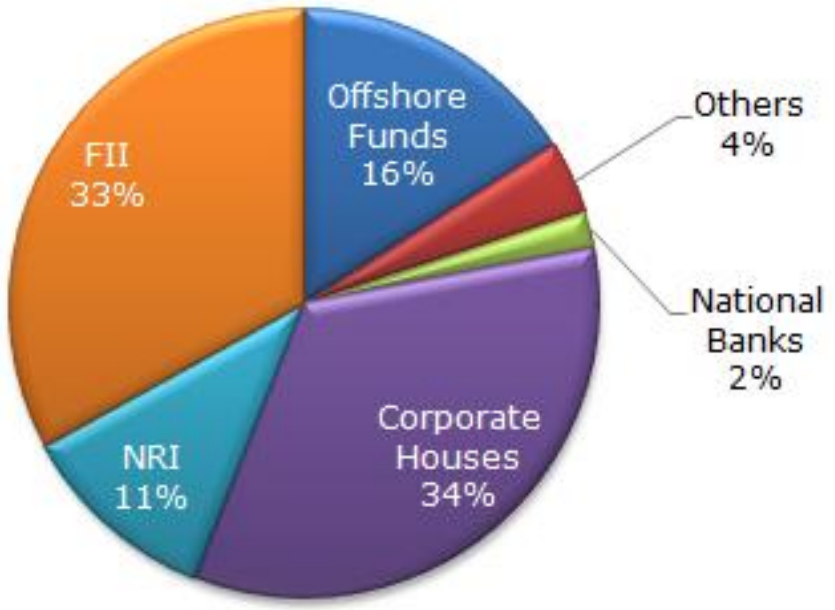
$$\text{Percentage decrease} = \frac{(925 - 785)}{925} \times 100 = \frac{140}{925} \times 100 \approx 15.14\%$$

The following pie chart shows the amount of subscriptions generated for India Bonds from different categories of investors.

Subscriptions Generated for India Bonds



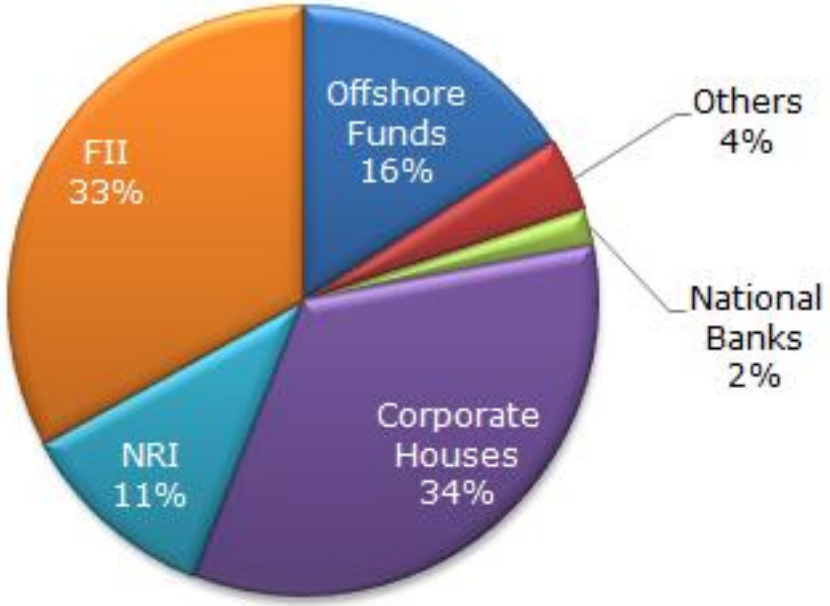
In the corporate sector, approximately how many degrees should be there in the central angle ?



34 x 3.6 = 122.4 (since 1% = 3.6 degrees)

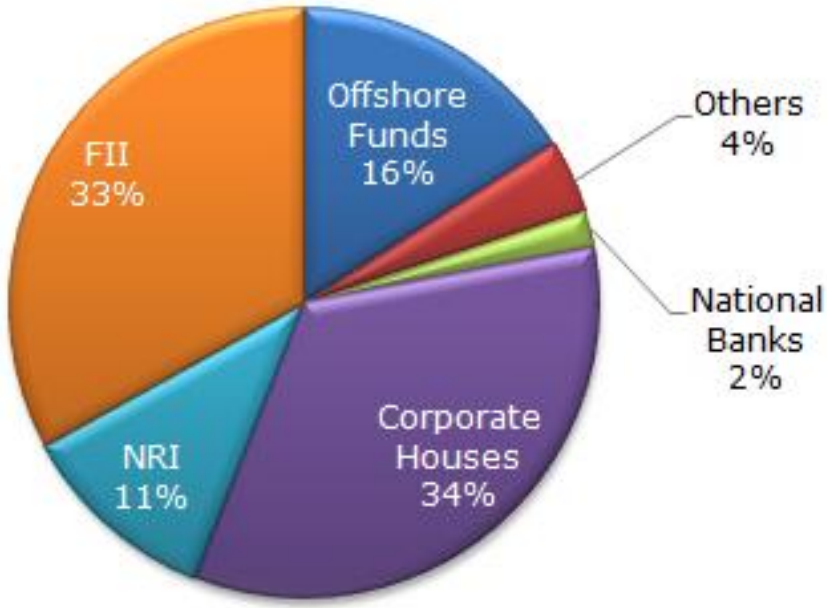
If the investment by NRI's are Rs 4,000 crore, then the investments by corporate houses and FII's together is:

(67/11) x 4000 = 24 363.6364

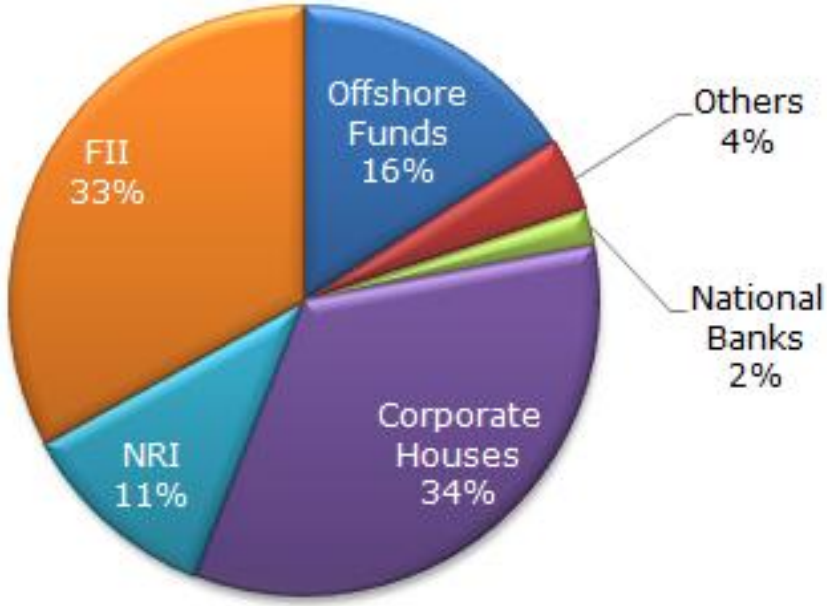


What percentage of the total investment is coming from FII's and NRI's ?

(33 + 11) = 44



If the total investment other than by FII and corporate houses is Rs 335,000 crore, then the investment by NRI's and Offshore funds will be (approximately) ?



Investment other than FII and corporate houses is 33% = 335000.

Also, investment by offshore funds and NRI's is equal to 27%.

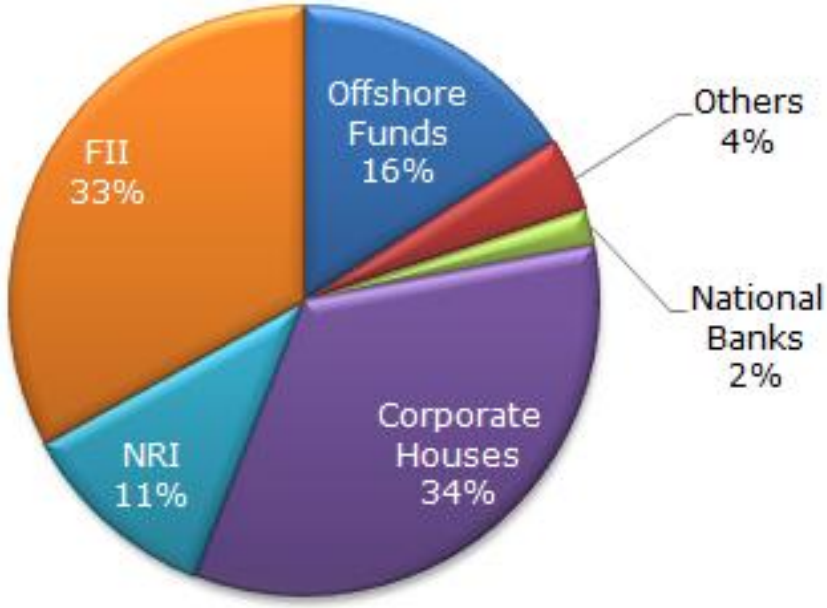
Hence, 27 x 335,000/33 = 274 090.909

If the total investment flows from FII's were to be doubled in the next year and the investment flows from all other sources had remained constant at their existing levels for this year, then what would be the proportion of FII investment in the total investment into India Bonds next year (in US $ millions) ?

FII's currently account for 33 out of 100.

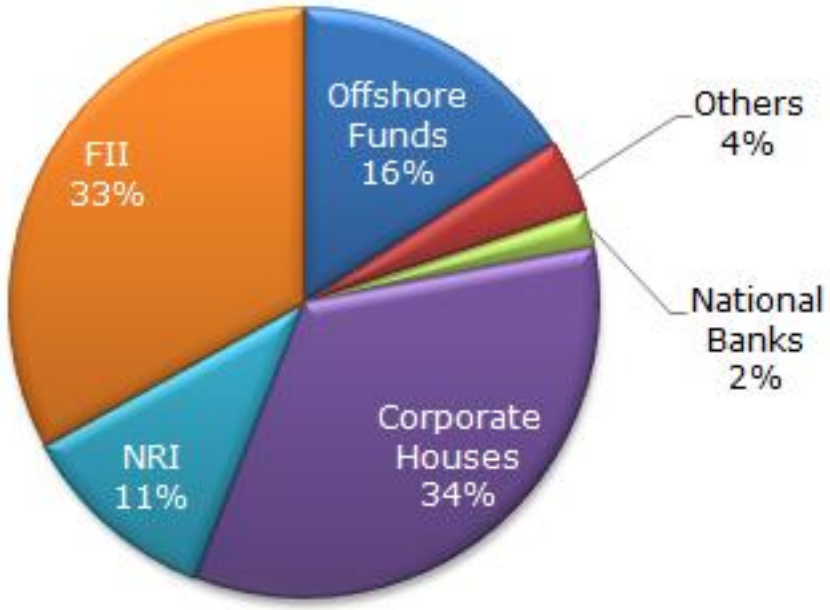
If their value is doubled and all other investments are kept constant then their new value would be 66 out of 133 =

approximately equal to 50%



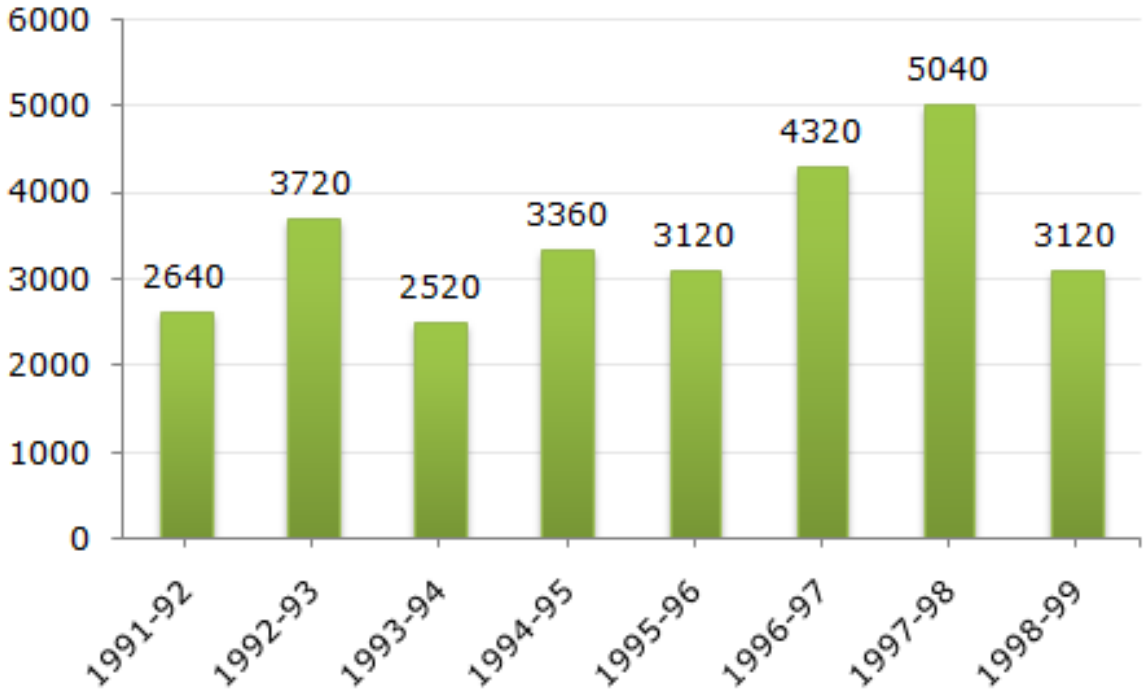
What is the approximate ratio of investment flows into India Bonds from NRI's to corporate houses ?

11:34 is approximately equal to 1:3



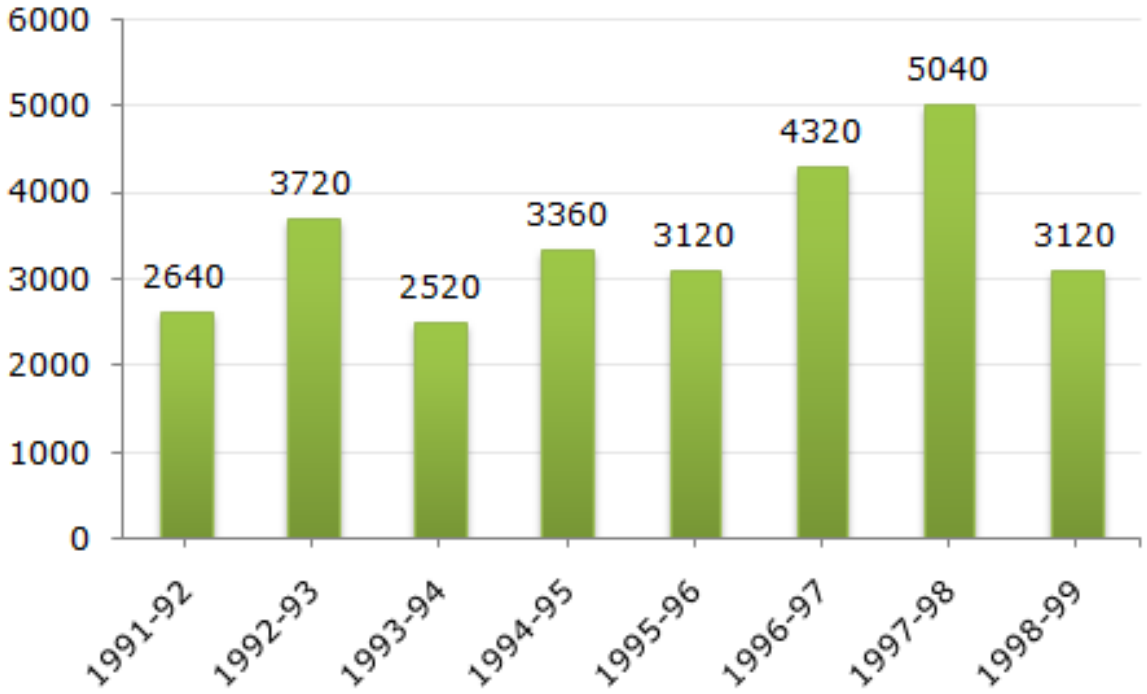
The bar graph given below shows the foreign exchange reserves of a country (in million US $) from 1991 - 1992 to 1998 - 1999. Answer the question based on this graph.

Foreign Exchange Reserves of a Country (in million US $)



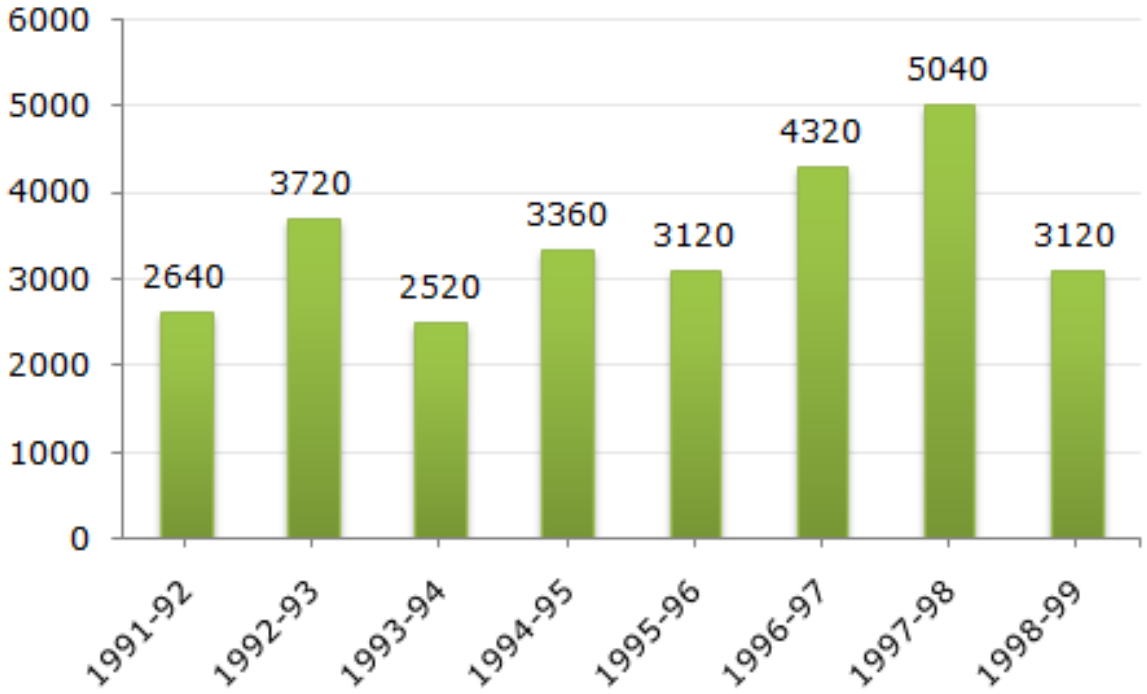
1. The foreign exchange reserves in 1997-98 was how many times that in 1994-95?
2. Find the percentage increase in the foreign exchange reserves in 1997-98 over 1993-94.
3. For which year, the percent increase of foreign exchange reserves over the previous year, is the highest?
4. The foreign exchange reserves in 1996-97 were approximately what percent of the average foreign exchange reserves over the period under review?
5. Find the ratio of the number of years, in which the foreign exchange reserves are above the average reserves, to those in which the reserves are below the average reserves.

The foreign exchange reserves in 1997-98 was how many times that in 1994-95?



$$\text{Required ratio} = \frac{5040}{3360} = 1.5.$$

Find the percentage increase in the foreign exchange reserves in 1997-98 over 1993-94.



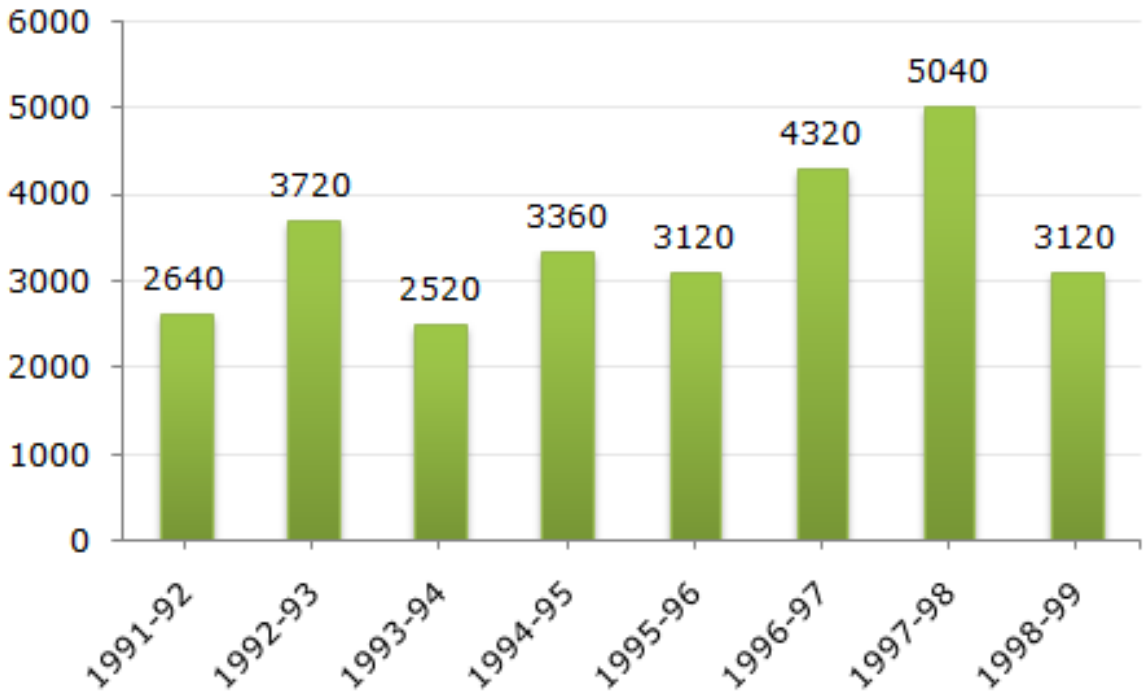
Foreign exchange reserves in 1997 - 1998 = 5040 million US $.

Foreign exchange reserves in 1993 - 1994 = 2520 million US $.

$\therefore$ Increase = (5040 - 2520) = 2520 US $.

$\therefore$ Percentage Increase = $\left(\frac{2520}{2520} \times 100\right)\% = 100\%$.

For which year, the percent increase of foreign exchange reserves over the previous year, is the highest?



There is an increase in foreign exchange reserves during the years 1992 - 1993, 1994 - 1995, 1996 - 1997, 1997 - 1998 as compared to previous year (as shown by bar-graph).

The percentage increase in reserves during these years compared to previous year are:

For 1992 - 1993 = $\left[\frac{(3720 - 2640)}{2640} \times 100\right]\% = 40.91\%$.

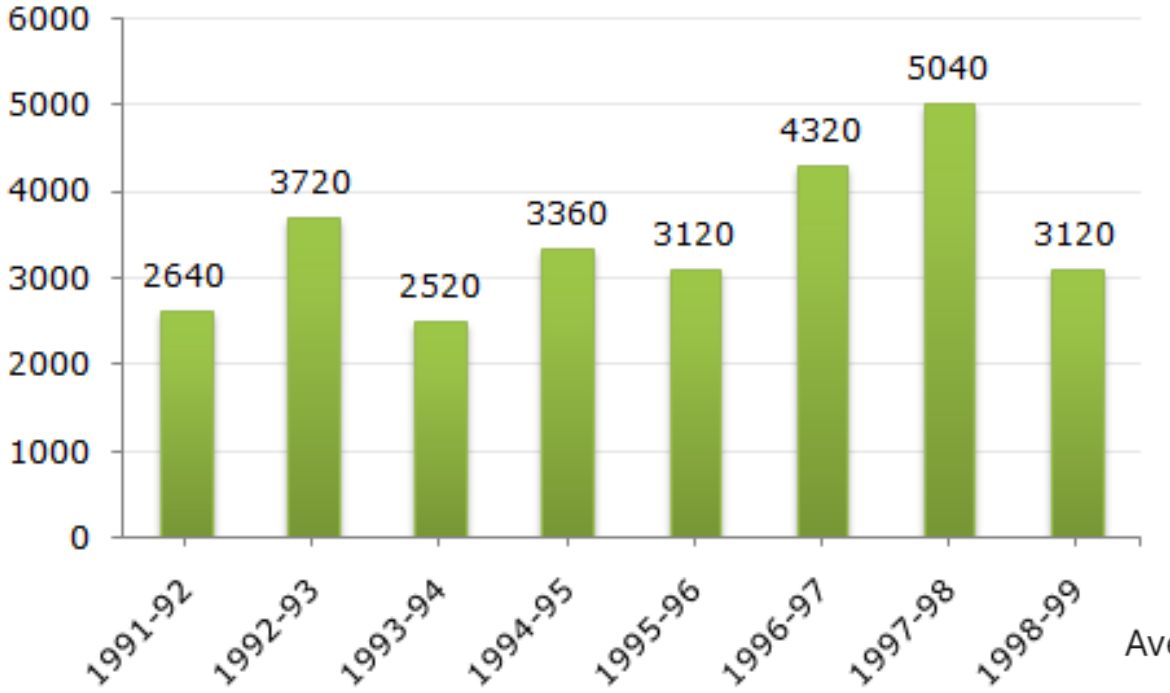
For 1994 - 1995 = $\left[\frac{(3360 - 2520)}{2520} \times 100\right]\% = 33.33\%$.

For 1996 - 1997 = $\left[\frac{(4320 - 3120)}{3120} \times 100\right]\% = 38.46\%$.

For 1997 - 1998 = $\left[\frac{(5040 - 4320)}{4320} \times 100\right]\% = 16.67\%$.

Clearly, the percentage increase over previous year is highest for 1992 - 1993.

The foreign exchange reserves in 1996-97 were approximately what percent of the average foreign exchange reserves over the period under review?



Average foreign exchange reserves over the given period

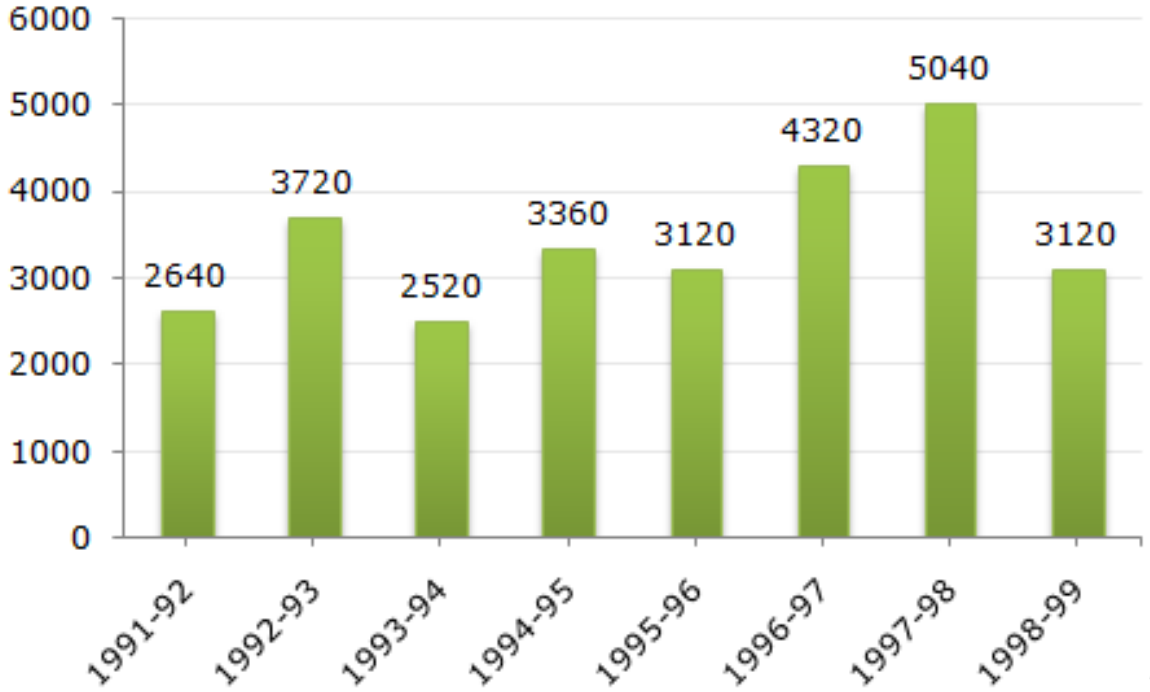
$= \left[\frac{1}{8} \text{ x } (2640 + 3720 + 2520 + 3360 + 3120 + 4320 + 5040 + 3120)\right]$ millic

= 3480 million US $.

Foreign exchange reserves in 1996 - 1997 = 4320 million US $.

$\therefore$ Required percentage $= \left(\frac{4320}{3480} \text{ x } 100\right)\% = 124.14\% \approx 125\%.$

The ratio of the number of years, in which the foreign exchange reserves are above the average reserves, to those in which the reserves are below the average reserves is?



Average foreign exchange reserves over the given period = 3480 million US $.

The country had reserves above 3480 million US $ during the years 1992-93, 1996-97 and 1997-98, i.e., for 3 years and below 3480 million US $ during the years 1991-92, 1993-94, 1994-95, 1995-56 and 1998-99 i.e., for 5 years.

Hence, required ratio = 3 : 5.

2. Study the following table and answer the questions.

Number of Candidates Appeared and Qualified in a Competitive Examination from Different States Over the Years

State	Year									
	1997		1998		1999		2000		2001	
	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.
M	5200	720	8500	980	7400	850	6800	775	9500	1125
N	7500	840	9200	1050	8450	920	9200	980	8800	1020
P	6400	780	8800	1020	7800	890	8750	1010	9750	1250
Q	8100	950	9500	1240	8700	980	9700	1200	8950	995
R	7800	870	7600	940	9800	1350	7600	945	7990	885

i. Total number of candidates qualified from all the states together in 1997 is approximately what percentage of the total number of candidates qualified from all the states together in 1998?

72%

77%

80%

83%

$$\text{Required percentage} = \left[\frac{(720 + 840 + 780 + 950 + 870)}{(980 + 1050 + 1020 + 1240 + 940)} \times 100\right]\%$$

$$= \left[\frac{4160}{5230} \times 100\right]\%$$

$$= 79.54\% \approx 80\%.$$

ii. What is the average candidates who appeared from State Q during the given years?

8700

8760

8990

8920

$$\text{Required average} = \frac{8100 + 9500 + 8700 + 9700 + 8950}{5}$$

$$= \frac{44950}{5}$$

$$= 8990.$$

iii. In which of the given years the number of candidates appeared from State P has maximum percentage of qualified candidates?

1997
1998
1999
2001

State	Year									
	1997		1998		1999		2000		2001	
	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.
M	5200	720	8500	980	7400	850	6800	775	9500	1125
N	7500	840	9200	1050	8450	920	9200	980	8800	1020
P	6400	780	8800	1020	7800	890	8750	1010	9750	1250
Q	8100	950	9500	1240	8700	980	9700	1200	8950	995
R	7800	870	7600	940	9800	1350	7600	945	7990	885

The percentages of candidates qual
State P during different years are:

For 1997 $\left(\frac{780}{6400} \times 100\right)\% = 12.19\%$.

For 1998 $\left(\frac{1020}{8800} \times 100\right)\% = 11.59\%$.

For 1999 $\left(\frac{890}{7800} \times 100\right)\% = 11.41\%$.

For 2000 $\left(\frac{1010}{8750} \times 100\right)\% = 11.54\%$.

For 2001 $\left(\frac{1250}{9750} \times 100\right)\% = 12.82\%$.

$\therefore$ Maximum percentage is for the year 2001.

iv. What is the percentage of candidates qualified from State N for all the years together, over the candidates appeared from State N during all the years together?

State	Year									
	1997		1998		1999		2000		2001	
	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.
M	5200	720	8500	980	7400	850	6800	775	9500	1125
N	7500	840	9200	1050	8450	920	9200	980	8800	1020
P	6400	780	8800	1020	7800	890	8750	1010	9750	1250
Q	8100	950	9500	1240	8700	980	9700	1200	8950	995
R	7800	870	7600	940	9800	1350	7600	945	7990	885

Required percentage $= \left[\frac{(840 + 1(}{(7500 + 92}\right.$

$= \left[\frac{4810}{43150} \times 100\right]\%$

$= 11.15\%$

3. The following table gives the percentage of marks obtained by seven students in six different subjects in an examination.

The Numbers in the Brackets give the Maximum Marks in Each Subject.

Student	Subject (Max. Marks)					
	Maths	Chemistry	Physics	Geography	History	Computer Science
	(150)	(130)	(120)	(100)	(60)	(40)
Ayush	90	50	90	60	70	80
Aman	100	80	80	40	80	70
Sajal	90	60	70	70	90	70
Rohit	80	65	80	80	60	60
Muskan	80	65	85	95	50	90
Tanvi	70	75	65	85	40	60
Tarun	65	35	50	77	80	80

i. What are the average marks obtained by all the seven students in Physics? (rounded off to two digit after decimal)

a. 77.26 b. 89.14 c. 91.37 d. 96.11

Student	Subject (Max. Marks)					
	Maths	Chemistry	Physics	Geography	History	Computer Science
	(150)	(130)	(120)	(100)	(60)	(40)
Ayush	90	50	90	60	70	80
Aman	100	80	80	40	80	70
Sajal	90	60	70	70	90	70
Rohit	80	65	80	80	60	60
Muskan	80	65	85	95	50	90
Tanvi	70	75	65	85	40	60
Tarun	65	35	50	77	80	80

Average marks obtained in Physics by all the seven stude

$= \frac{1}{7}$ x [(90% of 120) + (80% of 120) + (70% of 120)

+ (80% of 120) + (85% of 120) + (65% of 120) +

$= \frac{1}{7}$ x [(90 + 80 + 70 + 80 + 85 + 65 + 50)% of 120]

$= \frac{1}{7}$ x [520% of 120]

$= \frac{624}{7}$

= 89.14.

ii. The number of students who obtained 60% and above marks in all subjects is?

1

2

3

None

Student	Subject (Max. Marks)					
	Maths	Chemistry	Physics	Geography	History	Computer Science
	(150)	(130)	(120)	(100)	(60)	(40)
Ayush	90	50	90	60	70	80
Aman	100	80	80	40	80	70
Sajal	90	60	70	70	90	70
Rohit	80	65	80	80	60	60
Muskan	80	65	85	95	50	90
Tanvi	70	75	65	85	40	60
Tarun	65	35	50	77	80	80

From the table it is clear that Sajal and Rohit have 60% or more marks in each of the six subjects.

iii. What was the aggregate of marks obtained by Sajal in all the six subjects?

409

419

429

449

Student	Subject (Max. Marks)					
	Maths	Chemistry	Physics	Geography	History	Computer Science
	(150)	(130)	(120)	(100)	(60)	(40)
Ayush	90	50	90	60	70	80
Aman	100	80	80	40	80	70
Sajal	90	60	70	70	90	70
Rohit	80	65	80	80	60	60
Muskan	80	65	85	95	50	90
Tanvi	70	75	65	85	40	60
Tarun	65	35	50	77	80	80

Aggregate marks obtained by Sajal

= [(90% of 150) + (60% of 130) + (70% of 120)
+ (70% of 100) + (90% of 60) + (70% of 40)]

= [135 + 78 + 84 + 70 + 54 + 28]

= 449.

iv. In which subject is the overall percentage the best?

Maths

Chemistry

Physics

History

Student	Subject (Max. Marks)					
	Maths	Chemistry	Physics	Geography	History	Computer Science
	(150)	(130)	(120)	(100)	(60)	(40)
Ayush	90	50	90	60	70	80
Aman	100	80	80	40	80	70
Sajal	90	60	70	70	90	70
Rohit	80	65	80	80	60	60
Muskan	80	65	85	95	50	90
Tanvi	70	75	65	85	40	60
Tarun	65	35	50	77	80	80

Ans. Maths

4. The following table gives the percentage distribution of population of five states, P, Q, R, S and T on the basis of poverty line and also on the basis of sex.

State	Percentage of Population below the Poverty Line	Proportion of Males and Females	
		Below Poverty Line	Above Poverty Line
		M : F	M : F
P	35	5 : 6	6 : 7
Q	25	3 : 5	4 : 5
R	24	1 : 2	2 : 3
S	19	3 : 2	4 : 3
T	15	5 : 3	3 : 2

i. If the male population above poverty line for State R is 1.9 million, then the total population of State R is?

4.5 million

4.85 million

5.35 million

6.25 million

State	Percentage of Population below the Poverty Line	Proportion of Males and Females	
		Below Poverty Line	Above Poverty Line
		M : F	M : F
P	35	5 : 6	6 : 7
Q	25	3 : 5	4 : 5
R	24	1 : 2	2 : 3
S	19	3 : 2	4 : 3
T	15	5 : 3	3 : 2

Let the total population of State R be x million.

Then, population of State R above poverty line

$= [(100 - 24)\% \text{ of } x]$ million

$= \left(\frac{76}{100} \times x\right)$ million

And so, male population of State R above poverty line

$= \left[\frac{2}{5} \times \left(\frac{76}{100} \times x\right)\right]$ million

But, it is given that male population of State R above poverty line = 1.9 million.

$\therefore \frac{2}{5} \times \left(\frac{76}{100} \times x\right) = 1.9 \Rightarrow x = \frac{5 \times 100 \times 1.9}{76 \times 2} = 6.25.$

$\therefore$ Total population of State R = 6.25 million.

ii. What will be the number of females above the poverty line in the State S if it is known that the population of State S is 7 million?

3 million

2.43 million

1.33 million

5.7 million

State	Percentage of Population below the Poverty Line	Proportion of Males and Females	
		Below Poverty Line	Above Poverty Line
		M : F	M : F
P	35	5 : 6	6 : 7
Q	25	3 : 5	4 : 5
R	24	1 : 2	2 : 3
S	19	3 : 2	4 : 3
T	15	5 : 3	3 : 2

Total population of State S = 7 million.

$\therefore$ Population above poverty line

= [(100 - 19)% of 7] million

= (81% of 7) million

= 5.67 million.

And so, the number of females above poverty line in State S

$= \left(\frac{3}{7} \times 5.67\right)$ million

= 2.43 million.

Try these problems:

Study the following table and answer the questions given below it:

Number of Employees working in various departments of a factory

Year	Departments (Number of Employees)				
	Production	Sales	Purchase	Accounts	Research
1989	150	25	50	45	75
1990	225	40	45	62	70
1991	450	65	30	90	73
1992	470	73	32	105	70
1993	500	80	35	132	74
1994	505	75	36	130	75

1. Find the year in which the total number of employees reached approximately twice the total number of employees the factory had in the year 1989.
2. Find the department in which the number of employees approximately remained the same during the year 1989 to 1994.
3. Find the year in which the number of employees working in production department was less than 50% of the total employees.
4. Find the year in which each department had more number of employees than it had in the immediate preceding year.
5. Find the department that has less than 10% of the total employees all through the years 1989 to 1994.

Study the following table and answer the questions given below it:

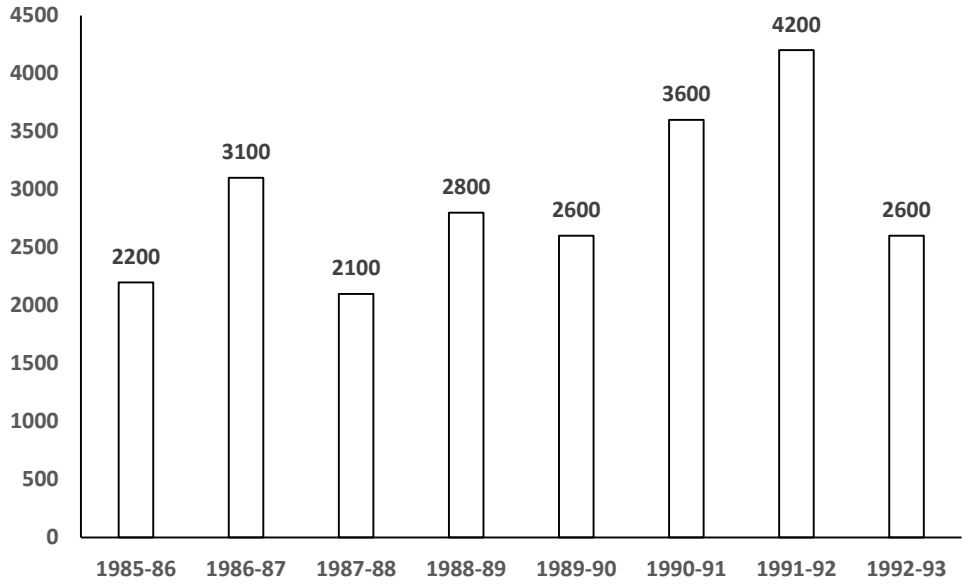
Number of students who go abroad for study from different states over the years

Year / State	1995	1996	1997	1998	1999
Maharashtra	723	840	900	920	925
Kerala	1035	940	1200	1400	1500
Karnataka	750	600	830	575	900
West Bengal	500	550	450	600	525
Delhi	1500	1625	1700	1475	1800
Andhra Pradesh	800	840	875	925	785

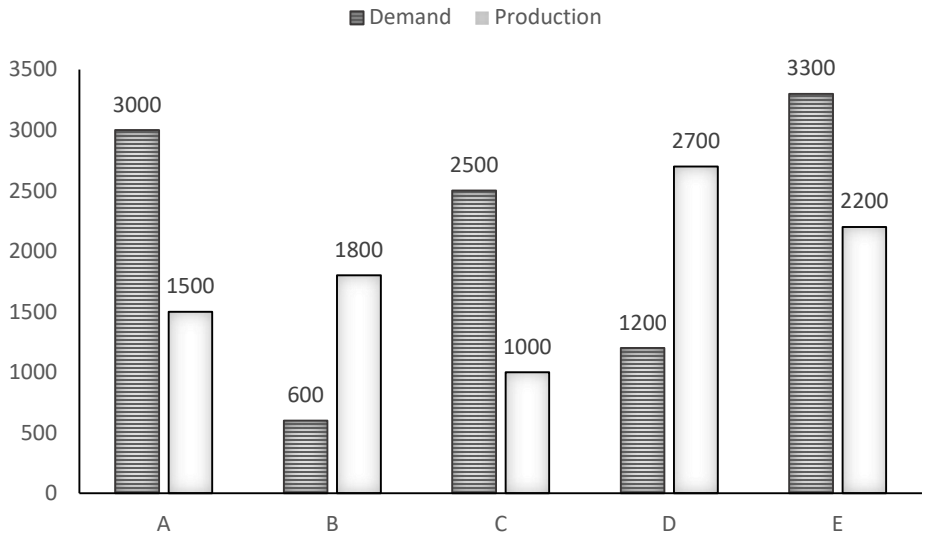
1. Find the state in which the least number of students go abroad over the years.
2. Find the year in which Kerala contribute approximately one-fifth of the total number of students in that year.
3. Find the state in which there is a continuous increase in the number of students over the given years.
4. Find the percentage increase in number of students from West Bengal from 1997 to 1998.
5. Find the percentage decrease in number of students from Andhra Pradesh from 1998 to 1999.

Try these problems

The bar diagram given below represents the trade deficit of a country. Study the diagram and answer the questions given below it:



1. Find the ratio of the number of years in which the trade deficit is above the average deficit to these in which the trade deficit is below the average deficit.
2. Find the percentage increase in deficit in 1991-92 as compared to the deficit in 1987-88.
3. The deficit in 1990-91 was approximately _____ percentage of the average deficit.
4. The deficit in 1991-92 was roughly ____ times the deficit in 1988-89.
5. Find in which year the percentage increase of deficit was highest to that in the preceding year.

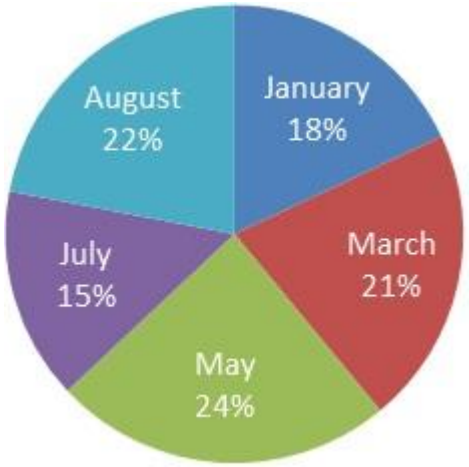


1. The production of company D is approximately _____ times of the production of the company A.
2. Find the ratio of companies having more demand than production to those having more production than the demand.
3. If company A desires to meet the demand by purchasing surplus refrigerators from a single company, then find which company can meet the need adequately.
4. Find the difference between average demand and average production of the five companies taken together.
5. The demand for company B is approximately ____ percentage of the demand for company C.

Mahindra Motors' production of Utility Vehicles for five months has been given in the pie chart for the year 2019. The company produces two kinds of Utility Vehicles – SUV and MUV.

In March, 900 more Utility Vehicles were produced than in July.

Production of SUVs & MUVs together in five months



1. Number of Utility Vehicles produced in these five months were 60% of total production in the year 2019. How many Utility vehicles were produced in other than these five months?
2. Number of Utility Vehicles produced in these five months were 60% of total production in the year 2019. How many Utility vehicles were produced in other than these five months?
3. Number of MUVs produced in May were 1200 and same number of SUVs were produced in January and also in July. Ratio of SUVs to MUVs produced in these months is:
4. Ratio of SUVs to MUVs produced in March and August were 44 : 19 and 13 : 9 respectively. What is ratio of difference between the number of SUVs and difference between the number of MUVs produced in these two months?
5. In February, SUVs produced were 300 more than MUVs produced. Each MUV costs Rs. 18 lakh and price of each SUV is 22(2/9)% more than an MUV. On selling all the Utility Vehicles produced in the February month, the company made a revenue of 426 crores. How many SUVs were produced in the February month?