

INDEX NUMBER

1.1 Calculate Index number

1	<p>The student population of school “A” increased from 768 students in year 1999 to 960 students in year 2002. Calculate the index number to show the change in the student population in year 2002 based on year 1999.</p> <p>[125]</p>	2	<p>The student population of a school “B” decreased from 800 students in year 2000 to 720 students in year 2002. Calculate the index number to show the change in the student population in year 2002 based on year 2000.</p> <p>[90]</p>
3	<p>Company “A” sold 504 units of a certain model of DVD player in year 2001. It only managed to sell 441 units in year 2003. Calculate the index number in year 2003 based on year 2001.</p> <p>[87.50]</p>	4	<p>Company “B” sold 910 units of a certain model of television in year 2002. It managed to sell 1021 units in year 2003. Calculate the index number in year 2003 based on year 2002.</p> <p>[112.2]</p>

1.2 Calculate price index

1	<p>Given</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Price of a semi auto washing machine</th> <th>Year</th> </tr> </thead> <tbody> <tr> <td>RM480</td> <td>2002</td> </tr> <tr> <td>RM560</td> <td>2003</td> </tr> </tbody> </table> <p>Calculate Price index for the year (a) 2003 based on year 2002 (b) 2002 based on year 2003 Round off your answer to the nearest integer.</p> <p>[117, 86]</p>	Price of a semi auto washing machine	Year	RM480	2002	RM560	2003	2	<p>Given</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Cost of cell phone</th> <th>Year</th> </tr> </thead> <tbody> <tr> <td>RM 5010</td> <td>1992</td> </tr> <tr> <td>RM 1550</td> <td>2005</td> </tr> </tbody> </table> <p>Calculate Price index for the year (a) 2005 based on year 1992 (b) 1992 based on year 2005 Round off your answer to the nearest integer.</p> <p>[31,323]</p>	Cost of cell phone	Year	RM 5010	1992	RM 1550	2005
Price of a semi auto washing machine	Year														
RM480	2002														
RM560	2003														
Cost of cell phone	Year														
RM 5010	1992														
RM 1550	2005														

3	<p>The price of a plate of fried noodles in the year 1998 and the year 2005 are RM2.40 and RM3.00 respectively. Calculate the price index for a plate of fried noodles in the year 1998 based on the year 2005.</p> <p>[80]</p>	4	<p>A particular pen cost RM0.80 in the year 1997 and RM0.90 in the year 1999. Calculate the price index of the pen in the year 1999 based on year 1997.</p> <p>[112.5]</p>																												
5	<p>Given</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Price in 1990</th> <th>Price in 1995</th> <th>Price index in 1995 based on 1990</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>RM2.00</td> <td>RM2.50</td> <td>x</td> </tr> <tr> <td>Q</td> <td>RM6.00</td> <td>RM9.00</td> <td>y</td> </tr> </tbody> </table> <p>Find the value of</p> <p>(i) x (ii) y</p> <p>[125, 150]</p>	Item	Price in 1990	Price in 1995	Price index in 1995 based on 1990	P	RM2.00	RM2.50	x	Q	RM6.00	RM9.00	y	6	<p>Given</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Price in 2000</th> <th>Price in 2005</th> <th>Price index in 2005 based on 2000</th> </tr> </thead> <tbody> <tr> <td>R</td> <td>RM15.00</td> <td>RM16.50</td> <td>x</td> </tr> <tr> <td>S</td> <td>RM24.00</td> <td>RM30.00.</td> <td>y</td> </tr> </tbody> </table> <p>Find the value of</p> <p>(iii) x (iv) y</p> <p>[110 , 125]</p>	Item	Price in 2000	Price in 2005	Price index in 2005 based on 2000	R	RM15.00	RM16.50	x	S	RM24.00	RM30.00.	y				
Item	Price in 1990	Price in 1995	Price index in 1995 based on 1990																												
P	RM2.00	RM2.50	x																												
Q	RM6.00	RM9.00	y																												
Item	Price in 2000	Price in 2005	Price index in 2005 based on 2000																												
R	RM15.00	RM16.50	x																												
S	RM24.00	RM30.00.	y																												
7	<p>Given</p> <table border="1"> <thead> <tr> <th rowspan="2">Ingredients</th> <th colspan="2">Price per kg (RM)</th> <th rowspan="2">Price index for the year 2004 based on the year 2001</th> </tr> <tr> <th>Year 2001</th> <th>Year 2004</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>0.80</td> <td>1.05</td> <td>x</td> </tr> <tr> <td>Q</td> <td>0.45</td> <td>0.70</td> <td>y</td> </tr> </tbody> </table> <p>Find the value of</p> <p>(i) x (ii) y</p> <p>[131.3, 155.6]</p>	Ingredients	Price per kg (RM)		Price index for the year 2004 based on the year 2001	Year 2001	Year 2004	P	0.80	1.05	x	Q	0.45	0.70	y	8	<p>Given</p> <table border="1"> <thead> <tr> <th rowspan="2">Ingredients</th> <th colspan="2">Price per kg (RM)</th> <th rowspan="2">Price index for the year 2003 based on the year 2000</th> </tr> <tr> <th>Year 2000</th> <th>Year 2003</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>12.00</td> <td>11.85</td> <td>x</td> </tr> <tr> <td>Q</td> <td>14.10</td> <td>15.60</td> <td>y</td> </tr> </tbody> </table> <p>Find the value of</p> <p>(iii) x (iv) y</p> <p>[98.75 , 110.6]</p>	Ingredients	Price per kg (RM)		Price index for the year 2003 based on the year 2000	Year 2000	Year 2003	P	12.00	11.85	x	Q	14.10	15.60	y
Ingredients	Price per kg (RM)		Price index for the year 2004 based on the year 2001																												
	Year 2001	Year 2004																													
P	0.80	1.05	x																												
Q	0.45	0.70	y																												
Ingredients	Price per kg (RM)		Price index for the year 2003 based on the year 2000																												
	Year 2000	Year 2003																													
P	12.00	11.85	x																												
Q	14.10	15.60	y																												

9	<p>The diagram below shows the price indices of three types of house.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="text-align: left;">Year house</th> <th>1995 (1990=100)</th> <th>2000 (1990=100)</th> <th>2000 (1995=100)</th> </tr> </thead> <tbody> <tr> <td>Terrace</td> <td>160</td> <td>240</td> <td>p</td> </tr> <tr> <td>Bungalow</td> <td>q</td> <td>180</td> <td>200</td> </tr> <tr> <td>Apartment</td> <td>175</td> <td>r</td> <td>140</td> </tr> </tbody> </table> <p>Find the value of p, q and r.</p>	Year house	1995 (1990=100)	2000 (1990=100)	2000 (1995=100)	Terrace	160	240	p	Bungalow	q	180	200	Apartment	175	r	140	10	<p>The diagram below shows the price indices of three types of fruit.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="text-align: left;">Year house</th> <th>1996 (1992=100)</th> <th>2003 (1992=100)</th> <th>2003 (1996=100)</th> </tr> </thead> <tbody> <tr> <td>Banana</td> <td>125</td> <td>150</td> <td>p</td> </tr> <tr> <td>Rambutan</td> <td>q</td> <td>150</td> <td>120</td> </tr> <tr> <td>Durian</td> <td>110</td> <td>r</td> <td>135</td> </tr> </tbody> </table> <p>Find the value of p, q and r.</p>	Year house	1996 (1992=100)	2003 (1992=100)	2003 (1996=100)	Banana	125	150	p	Rambutan	q	150	120	Durian	110	r	135
Year house	1995 (1990=100)	2000 (1990=100)	2000 (1995=100)																																
Terrace	160	240	p																																
Bungalow	q	180	200																																
Apartment	175	r	140																																
Year house	1996 (1992=100)	2003 (1992=100)	2003 (1996=100)																																
Banana	125	150	p																																
Rambutan	q	150	120																																
Durian	110	r	135																																
	[150, 90, 245]		[120, 125, 148.5]																																

1.3 Find Q_0 or Q_1 given relevant information

1	<p>The price of a plate of fried noodles in year 2005 was RM3.00 The price index for a plate of fried noodles in the year 1998 based on the year 2005 was 80. Calculate the price of the fried noodle in year 1998..</p>	2	<p>A particular pen cost RM0.80 in the year 1997 and the price index of the pen in the year 1999 based on year 1997 was 112.5. Calculate the price for that particular pen in year 1999.</p>
	[RM2.40]		[RM0.90]
3	<p>The average monthly phone bill for a school in the year 2000 was RM60.00. The price index of the phone bill was 125 in the year 2004, using year 2000 as the base year. Calculate the average monthly phone bill for the school in the year 2004.</p>	4	<p>Hanim's total salary in the year 1996 is RM12200. The price index for Hanim's total salary is 134 in the year 2000 based on the year 1996. Calculate Hanim's total salary in the year 2000.</p>
	[RM75]		[RM16,348]

5	<p>The price for 1 kg of salt in the year 2002 was RM1.20. The price index of 1 kg of salt in the year 2002 using year 2001 as the base year was 150. Calculate the price of 1 kg of salt in the year 2001.</p>	6	<p>A company's profits from online sales in the year 2002 were RM1.8 million. The price index of the profit from online sales through internet for the company in year 2002 based on year 2001 is 120. Calculate the profits from online sales in the year 2001.</p>
	[RM0.80]		[RM1.5 million]
7	<p>The price indices of an item in year 1987 and 1999 based on year 1996 were 105 and 120 respectively. If the price of the same item in year 1999 was RM50.40, find the price of the item in year 1987.</p>	8	<p>The price index for a scientific calculator in the year 1998 and the year 2000 are 130 and 145 respectively when the year 1985 is used as the base year. Find the price of the scientific calculator in the year 1985 if the price in the year 2000 is RM58.00</p>
	[RM44.10]		[RM52]

2.1 Calculate composite index

1	<p>The table below shows the index numbers and the weightages of three items. Calculate the composite index of all the items.</p> <table border="1"> <tr> <td>Item</td> <td>A</td> <td>B</td> <td>C</td> </tr> <tr> <td>Index number</td> <td>105</td> <td>120</td> <td>116</td> </tr> <tr> <td>weightage</td> <td>4</td> <td>1</td> <td>5</td> </tr> </table>	Item	A	B	C	Index number	105	120	116	weightage	4	1	5	2	<p>The table below shows the index numbers and the weightages of three items. Calculate the composite index of all the items.</p> <table border="1"> <tr> <td>Item</td> <td>A</td> <td>B</td> <td>C</td> </tr> <tr> <td>Index number</td> <td>117</td> <td>105</td> <td>120</td> </tr> <tr> <td>weightage</td> <td>3</td> <td>1</td> <td>2</td> </tr> </table>	Item	A	B	C	Index number	117	105	120	weightage	3	1	2
Item	A	B	C																								
Index number	105	120	116																								
weightage	4	1	5																								
Item	A	B	C																								
Index number	117	105	120																								
weightage	3	1	2																								
	[112]		[116]																								

<p>3</p>	<p>The table below shows the price indices of four types of food items in year 2000 based on year 1995, together with their respective weightages.</p> <table border="1"> <thead> <tr> <th>Food Item</th> <th>Price Index</th> <th>weightage</th> </tr> </thead> <tbody> <tr> <td>Meat</td> <td>120</td> <td>8</td> </tr> <tr> <td>Rice</td> <td>110</td> <td>7</td> </tr> <tr> <td>Milk</td> <td>130</td> <td>2</td> </tr> <tr> <td>vegetable</td> <td>90</td> <td>3</td> </tr> </tbody> </table> <p>Calculate the composite index of all the food items in year 2000 based on year 1995.</p> <p>[113]</p>	Food Item	Price Index	weightage	Meat	120	8	Rice	110	7	Milk	130	2	vegetable	90	3	<p>4</p>	<p>The table below shows the price indices of four types of magazines in year 2002 based on year 2000, together with their respective weightages.</p> <table border="1"> <thead> <tr> <th>Magazine</th> <th>Price Index</th> <th>weightage</th> </tr> </thead> <tbody> <tr> <td>'EDGE'</td> <td>115</td> <td>3</td> </tr> <tr> <td>'DIGEST'</td> <td>105</td> <td>6</td> </tr> <tr> <td>'TRADING'</td> <td>85</td> <td>7</td> </tr> <tr> <td>'WOMEN'</td> <td>180</td> <td>4</td> </tr> </tbody> </table> <p>Calculate the composite index of all the magazines in year 2002 based on year 2000.</p> <p>[114.5]</p>	Magazine	Price Index	weightage	'EDGE'	115	3	'DIGEST'	105	6	'TRADING'	85	7	'WOMEN'	180	4
Food Item	Price Index	weightage																															
Meat	120	8																															
Rice	110	7																															
Milk	130	2																															
vegetable	90	3																															
Magazine	Price Index	weightage																															
'EDGE'	115	3																															
'DIGEST'	105	6																															
'TRADING'	85	7																															
'WOMEN'	180	4																															
<p>5</p>	<p>The table shows the price indices and percentage of usage of four items, P,Q, R and S, which are the main ingredients in the production of a type of biscuit</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Price Index in year 2002 based on year 1999</th> <th>Percentage of usage (%)</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>115</td> <td>20</td> </tr> <tr> <td>Q</td> <td>125</td> <td>40</td> </tr> <tr> <td>R</td> <td>120</td> <td>10</td> </tr> <tr> <td>S</td> <td>85</td> <td>30</td> </tr> </tbody> </table> <p>Calculate the composite index of all the items in year 2002 based on year 1999.</p> <p>[110.5]</p>	Item	Price Index in year 2002 based on year 1999	Percentage of usage (%)	P	115	20	Q	125	40	R	120	10	S	85	30	<p>6</p>	<p>The table shows the price indices and percentage of usage of four items, P,Q, R and S, which are the main ingredients in the production of a type of pie.</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Price Index in year 2004 based on year 2000</th> <th>Percentage of usage (%)</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>80</td> <td>20</td> </tr> <tr> <td>Q</td> <td>120</td> <td>30</td> </tr> <tr> <td>R</td> <td>110</td> <td>10</td> </tr> <tr> <td>S</td> <td>85</td> <td>40</td> </tr> </tbody> </table> <p>Calculate the composite index of all the items in year 2004 based on year 2000.</p> <p>[97]</p>	Item	Price Index in year 2004 based on year 2000	Percentage of usage (%)	P	80	20	Q	120	30	R	110	10	S	85	40
Item	Price Index in year 2002 based on year 1999	Percentage of usage (%)																															
P	115	20																															
Q	125	40																															
R	120	10																															
S	85	30																															
Item	Price Index in year 2004 based on year 2000	Percentage of usage (%)																															
P	80	20																															
Q	120	30																															
R	110	10																															
S	85	40																															

2.2 Finding index number or weightage given relevant information

<p>1</p> <p>The table below shows the price index and the weightages of three types of item in the year 1997 using 1993 as the based year.</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Price index</th> <th>Weightage</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>105</td> <td>x</td> </tr> <tr> <td>Q</td> <td>120</td> <td>1</td> </tr> <tr> <td>R</td> <td>116</td> <td>5</td> </tr> </tbody> </table> <p>The composite index of all the items in year 1997 based on year 1993 was 112. Find the value of x.</p> <p>[4]</p>	Item	Price index	Weightage	P	105	x	Q	120	1	R	116	5	<p>2</p> <p>The table below shows the price indices and the weightage of four types of food for the year 2000 using 1995 as the base year.</p> <table border="1"> <thead> <tr> <th>Food</th> <th>Price index</th> <th>Weightage</th> </tr> </thead> <tbody> <tr> <td>chicken</td> <td>123</td> <td>7</td> </tr> <tr> <td>fish</td> <td>115</td> <td>p</td> </tr> <tr> <td>Beef</td> <td>138</td> <td>5</td> </tr> <tr> <td>prawn</td> <td>148</td> <td>3</td> </tr> </tbody> </table> <p>The composite index of the four types of food for the year 2000 based on year 1995 was 128.5. Calculate the value for p</p> <p>[5]</p>	Food	Price index	Weightage	chicken	123	7	fish	115	p	Beef	138	5	prawn	148	3
Item	Price index	Weightage																										
P	105	x																										
Q	120	1																										
R	116	5																										
Food	Price index	Weightage																										
chicken	123	7																										
fish	115	p																										
Beef	138	5																										
prawn	148	3																										
<p>3</p> <p>The table below shows the price index and the weightages of three types of item in the year 2001 using 1999 as the based year.</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Price index</th> <th>Weightage</th> </tr> </thead> <tbody> <tr> <td>W</td> <td>a</td> <td>3</td> </tr> <tr> <td>X</td> <td>90</td> <td>2</td> </tr> <tr> <td>Y</td> <td>110</td> <td>5</td> </tr> </tbody> </table> <p>The composite index of all the items in year 2001 based on year 1999 was 133. Find the value of a.</p> <p>[200]</p>	Item	Price index	Weightage	W	a	3	X	90	2	Y	110	5	<p>4</p> <p>The table below shows the price indices of four types of bag sold by a trader for the year 1998 using 1995 as the base year.</p> <table border="1"> <thead> <tr> <th>Bag</th> <th>Price index</th> <th>Monthly expenditure in year 1998(RM)</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>x</td> <td>3000</td> </tr> <tr> <td>B</td> <td>122</td> <td>4000</td> </tr> <tr> <td>C</td> <td>119</td> <td>5000</td> </tr> <tr> <td>D</td> <td>110</td> <td>2000</td> </tr> </tbody> </table> <p>The composite index of the four types of bag for the year 1998 based on year 1995 was 113. Calculate the value for x</p> <p>[95]</p>	Bag	Price index	Monthly expenditure in year 1998(RM)	A	x	3000	B	122	4000	C	119	5000	D	110	2000
Item	Price index	Weightage																										
W	a	3																										
X	90	2																										
Y	110	5																										
Bag	Price index	Monthly expenditure in year 1998(RM)																										
A	x	3000																										
B	122	4000																										
C	119	5000																										
D	110	2000																										

<p>5 The table shows the price indices and percentage of usage of four items, P,Q, R and S, which are the main ingredients in the production of a type of biscuit</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="width: 20%;">Item</th> <th style="width: 30%;">Price Index in year 2002 based on year 1999</th> <th style="width: 50%;">Percentage of usage (%)</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>115</td> <td>20</td> </tr> <tr> <td>Q</td> <td>125</td> <td>p</td> </tr> <tr> <td>R</td> <td>x</td> <td>10</td> </tr> <tr> <td>S</td> <td>85</td> <td>30</td> </tr> </tbody> </table> <p>The composite index of all the items in year 2002 based on year 1999 was 110.5. Find the value of</p> <p>(i) p (ii) x</p> <p style="text-align: right; margin-top: 20px;">[40, 120]</p>	Item	Price Index in year 2002 based on year 1999	Percentage of usage (%)	P	115	20	Q	125	p	R	x	10	S	85	30	<p>6 The table shows the price indices and percentage of usage of four items, P,Q, R and S, which are the main ingredients in the production of a type of pie. The composite index of all the items in year 2004 based on year 2000 was 97</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="width: 20%;">Item</th> <th style="width: 30%;">Price Index in year 2004 based on year 2000</th> <th style="width: 50%;">Percentage of usage (%)</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>80</td> <td>20</td> </tr> <tr> <td>Q</td> <td>120</td> <td>30</td> </tr> <tr> <td>R</td> <td>110</td> <td>x</td> </tr> <tr> <td>S</td> <td>y</td> <td>40</td> </tr> </tbody> </table> <p>Calculate the value for</p> <p>(i) x (ii) y</p> <p style="text-align: right; margin-top: 20px;">[10, 85]</p>	Item	Price Index in year 2004 based on year 2000	Percentage of usage (%)	P	80	20	Q	120	30	R	110	x	S	y	40
Item	Price Index in year 2002 based on year 1999	Percentage of usage (%)																													
P	115	20																													
Q	125	p																													
R	x	10																													
S	85	30																													
Item	Price Index in year 2004 based on year 2000	Percentage of usage (%)																													
P	80	20																													
Q	120	30																													
R	110	x																													
S	y	40																													

2.3 Solve problems involving index number and composite index

1. Table below shows the prices, price indices and the weightage for Mr. Loo's various expenditures.

expenditure	Price		Price index	Weightage
	2000	2003		
Food	900	1089	121	10
Transport	x	480	120	5
Clothing	300	336	z	4
Utility	600	y	117	6
Rental	250	275	110	3

Find

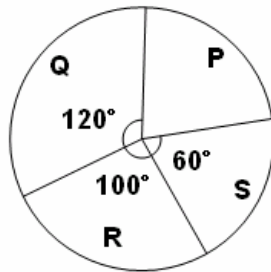
- (a) the value for x, y and z
- (b) The composite index for the year 2003 using year 2000 as the based year.
- (c) Mr. Loo's monthly expenditure in year 2003 was RM4200.00. Find his corresponding monthly expenditure in the year 2000.

Answer : [RM400, RM702, 112, 117.5 RM3574.47]

2. Table below shows the prices and the price indices for the four ingredients, P,Q,R and S, used in making biscuits of a particular kind.

Ingredients	Price per kg (RM)		Price index for the year 2004 based on the year 2001
	Year 2001	Year 2004	
P	0.80	1.00	x
Q	2.00	y	140
R	0.40	0.60	150
S	z	0.40	80

Diagram below show a pie chart which represents the relative amount of the ingredients P,Q,R and S, used in making these biscuits.



- (a) Find the value of x, y and z.
 (b) (i) Calculate the composite index for the cost of making these biscuits in the year 2004 based on the year 2001.
 (ii) hence, calculate the corresponding cost of making these biscuits in the year 2001 if the cost in the year 2004 was RM2985.

Answer (a) 125, 2.80, 0.50 (b) 129.44, RM2306.09

3. Table below shows the price indices and percentage of usage of four items, P,Q, R and S, which are the main ingredients in the production of a type of biscuit.

Item	Price index for the year 1995 Based on the year 1993	Percentage of usage (%)
P	135	40
Q	x	30
R	105	10
S	130	20

- (a) Calculate
 (i) the price of S in year 1993 if its price in the year 1995 is RM37.70.
 (ii) the price index of P in the year 1995 based on the year 1991 if its price index in the year 1993 based on the year 1991 is 120.
 (b) The composite index number of the cost of biscuit production for the year 1995 based on the year 1993 is 128, Calculate
 (i) the value of x
 (ii) the price of a box of biscuit in the year 1993 if the corresponding price in the year 1995 is RM32.00

Answer (a) RM29.00, 162, (b) 125, RM25.00