

# Numerical Reasoning

## Free Test 1

Solutions Booklet

### Instructions

This numerical reasoning test comprises **21 questions**, and you will have **21 minutes** in which to correctly answer as many as you can. Calculators are permitted for this test, and it is recommended you have some rough paper to work on.

You will have to work quickly and accurately to perform well in this test. If you don't know the answer to a question, leave it and come back to it if you have time. Each question will have five possible answers, one of which is correct. You may click Back and Next during the test to review or skip questions.

You can submit your test at any time. If the time limit is up before you click submit the test will automatically be submitted with the answers you have selected. It is recommended to keep working until the time limit is up.

Try to find a time and place where you will not be interrupted during the test. **The test will begin on the next page.**

## Share Price Index

Company	Today's Price (€)	Change from previous day (%)	Past 12 months	
			Maximum price (€)	Minimum price (€)
Huver Co.	1,150	1.10	1,360	860
Drebs Ltd	18	0.50	22	11
Fevs Plc	1,586	-9.00	1,955	1,242
Fauvers	507	-1.00	724	464
Steapars	2,537	1.00	2,630	2,216

## Dividend Index

Dividend paid per share (€)	Huver Co.	Drebs Ltd	Fevs Plc	Fauvers	Steapars
Interim Dividend	0.83	0.44	0.34	0.09	0.48
Final Dividend	1.75	1.12	1.25	0.32	0.96

**Note:** the total annual dividend paid per share is the sum of the interim dividend and the final dividend.

**Q1** Which share had the largest difference between highest and lowest price over the last 12 months?

- (A) Huver Co.
- (B) Drebs Ltd
- (C) Fevs Plc
- (D) Fauvers
- (E) Steapars

The information that we need is shown in the table Share Prices.

**Step 1** - Calculate the difference between the maximum and the minimum prices.

Huver Co. =  $1,360 - 860 = 500$

Drebs Ltd =  $22 - 11 = 11$

Fevs Plc =  $1,955 - 1,242 = 713$

Fauvers =  $724 - 464 = 260$

Steapars =  $2,630 - 2,216 = 414$

**Tip:** Notice the wording of the question is asking for the share with the largest absolute change in price, NOT the largest percentage change, which would have been Drebs Ltd. If the question had wanted the percentage change it would have used the word percentage.

Thus the correct answer is (C) Fevs Plc

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**Note:** the total annual dividend paid per share is the sum of the interim dividend and the final dividend.

**Q2** What was yesterday's cost difference between 50 shares in Fevs plc and 100 shares in Steapars?

- (A) €164,726
- (B) €251,163
- (C) €172,577
- (D) €164,045
- (E) None of these

The information that we need is shown in the table Share prices.

**Step 1** - Calculate yesterday's share price for each share:

$$\text{Fevs plc} = 1,586 \div 0.91 = 1,742.86$$

$$\text{Steapars} = 2,537 \div 1.01 = 2,511.88$$

**Step 2** - Calculate the cost difference between 50 Fevs and 100 Steapars shares yesterday:

$$50 \times 1,742.86 = 87,143$$

$$100 \times 2,511.88 = 251,188$$

$$\text{Difference} = 251,188 - 87,143 = 164,045$$

**Tip:** Percentage increases and decreases catch out a lot of people. For this question, think about what's happening. The percentage change from yesterday to today in the case of Fevs is a 9% decrease. So that means (today's price)  $\div$  (yesterday's price) = 0.91 (a 9% decrease). Using algebra we can recast this as yesterday's price = today's price  $\div$  0.91.

Thus the correct answer is (D) €164,045

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**Note:** the total annual dividend paid per share is the sum of the interim dividend and the final dividend.

**Q3** Today's Drebs Ltd share price represents a 40% increase on the price one month ago. What was the Drebs Ltd share price a month ago?

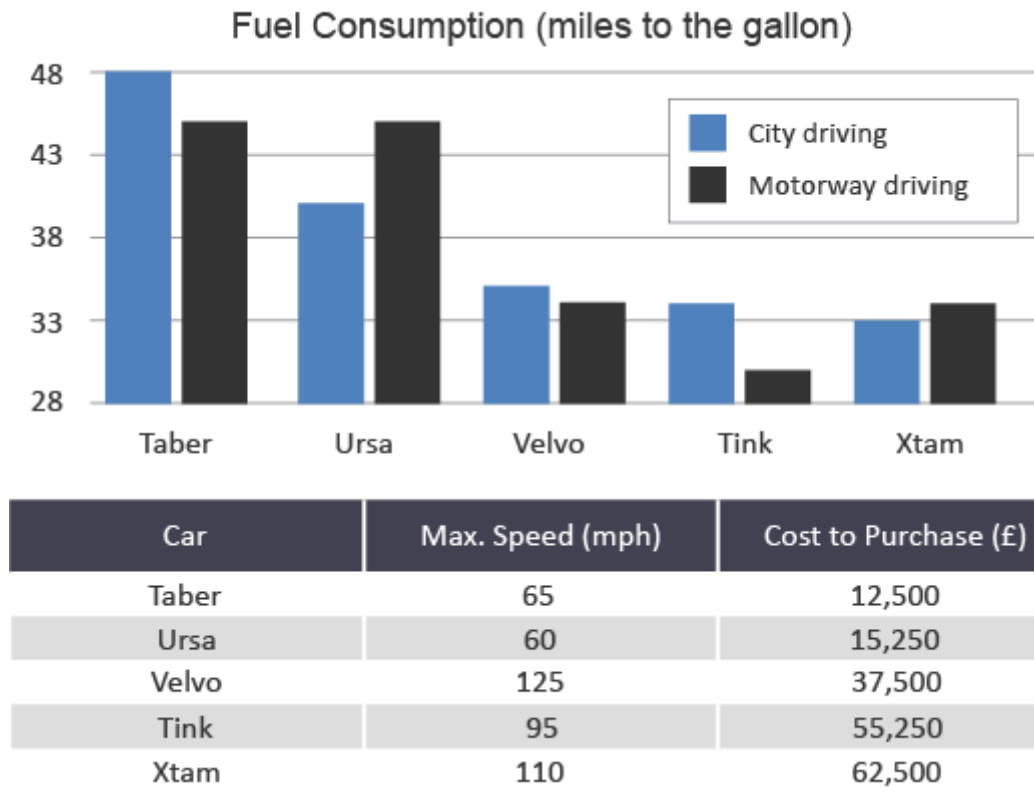
- (A) €22
- (B) €25.20
- (C) €12.68
- (D) €12.90
- (E) €12.86

The information that we need is shown in the table Share prices.

**Step 1** - Drebs Ltd's share price is shown as 18 Euros at today's prices.  
This is a 40% increase and so represents 1.40 (140%) of the price one month ago.

**Step 2** - The price one month ago is calculated as follows:  
 $18 \div 1.40 = 12.86$ .

Thus the correct answer is (E) €12.86



**Q4** If a driver travels an average of 4,250 miles per month driving along motorways in an Xtam car, what is the predicted annual consumption of fuel (in gallons)?

- (A) Cannot say
- (B) 1,500
- (C) 125
- (D) 150
- (E) 1,250

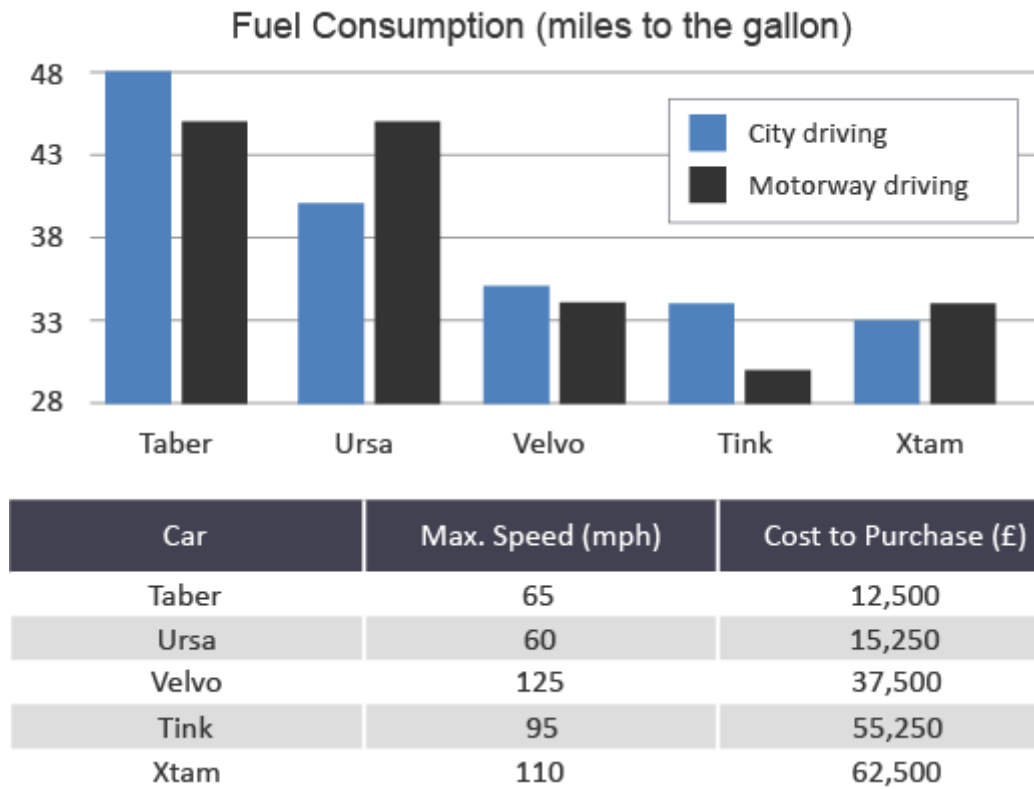
*The information that we need is shown in the graph Car Consumption.*

**Step 1** - The Xtam's fuel consumption is shown as 34 miles to the gallon for motorway driving.

So,  $4,250 \text{ miles} \div 34 = 125 \text{ gallons per month}$ .

**Step 2** - Annual petrol consumption =  $125 \times 12 = 1,500 \text{ gallons}$ .

Thus the correct answer is (B) 1,500



**Q5** A car dealership has £600,000 to spend and wants to buy equal numbers of the Taber and Ursa cars. What is the largest number of each type of car that can be ordered?

- (A) 27
- (B) 48
- (C) 19
- (D) 21
- (E) 22

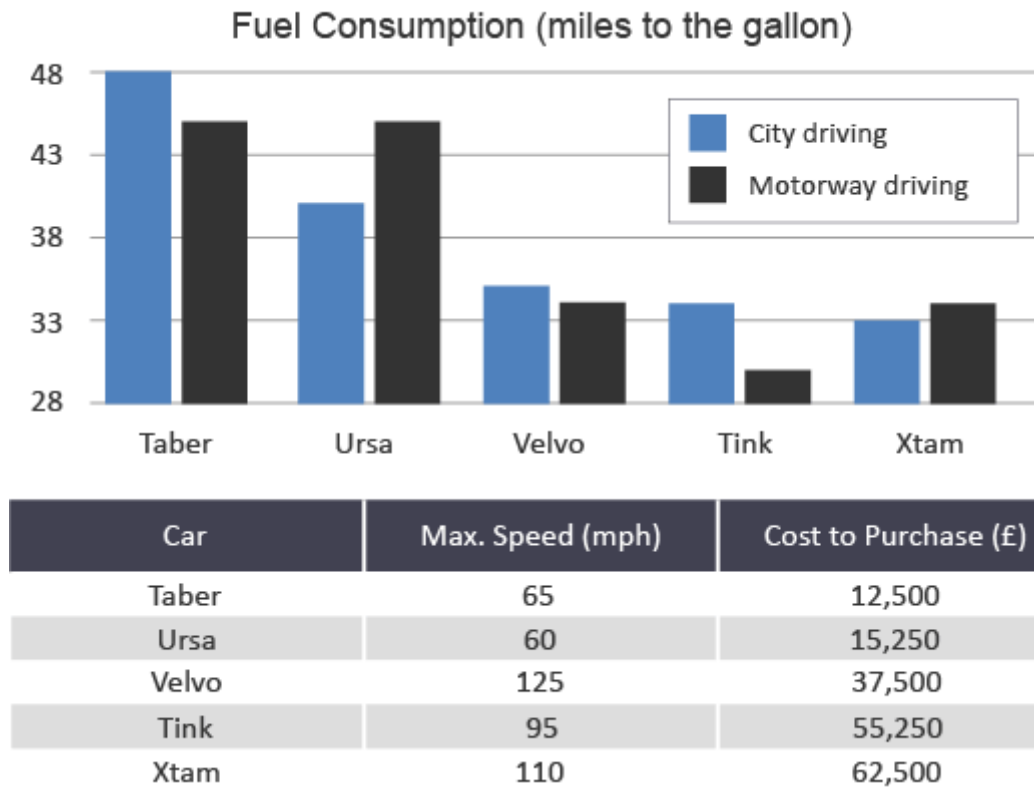
*The information that we need is shown in the table.*

**Step 1** - The cost of the Taber and Ursa cars are £12,500 and £15,250 respectively.

**Step 2** - Since the numbers of each car purchased must be equal, calculate the combined cost as follows:  $£12,500 + £15,250 = £27,750$ .

**Step 3** -  $£600,000 \div £27,750 = 21.6$ .

*Thus the correct answer is (D) 21*



**Q6** What is the ratio of the cost of a Taber: Velvo: Xtam?

- (A) 2:4:5
- (B) 1:4:6
- (C) 1:3:5
- (D) 2:3:5
- (E) 1:2:3

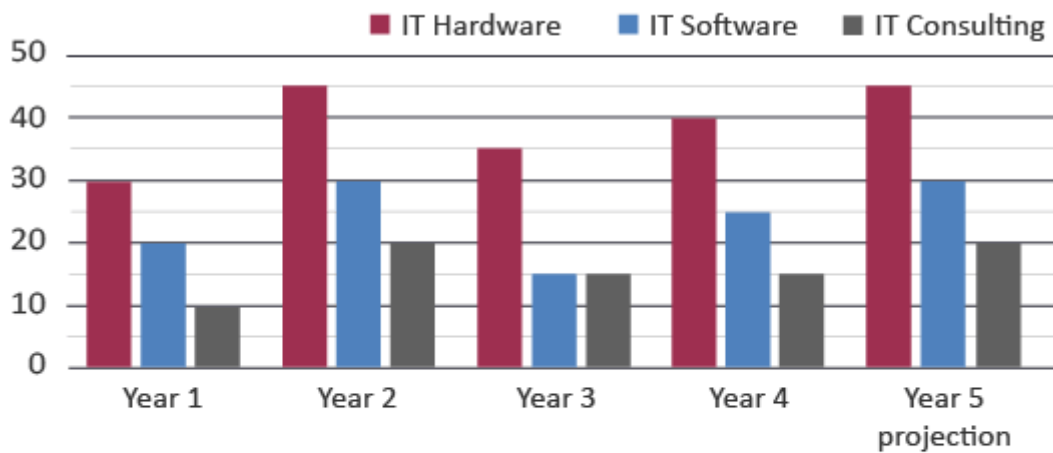
*The information that we need is shown in the table.*

**Step 1** - Taber: Velvo: Xtam costs = 12,500 : 37,500 : 62,500

*Notice the common denominator here is 12,500. So the ratio can be simplified to the following.  $12,500/12,500 : 37,500/12,500 : 62,500/12,500 = 1:3:5$ .*

*Thus the correct answer is (C) 1:3:5*

## Legal Sector IT Spending (£ millions)



### Two Legal Sector IT Firms Income for Consultancy Services (10,000s)

	Make Fit Ltd	Pure Gap Plc
Year 1	290	230
Year 2	180	310
Year 3	260	300
Year 4	320	290

**Q7** Legal sector spending on IT hardware, IT software and IT consulting are all set to increase by the same amounts in Year 6 as they did from Year 4 to Year 5. Assuming this is the case, what is the total legal sector spend in Year 6 on these three IT areas combined?

- (A) £75 million
- (B) £85 million
- (C) £95 million
- (D) £105 million
- (E) £110 million

*The information that we need is shown in the graph IT spending by the legal sector.*

**Step 1** - Calculate the increases in each IT spending category

IT hardware = 45 (increase of £5 million from Year 4)

IT software = 30 (increase of £5 million from Year 4)

IT consulting = 20 (increase of £5 million from Year 4)

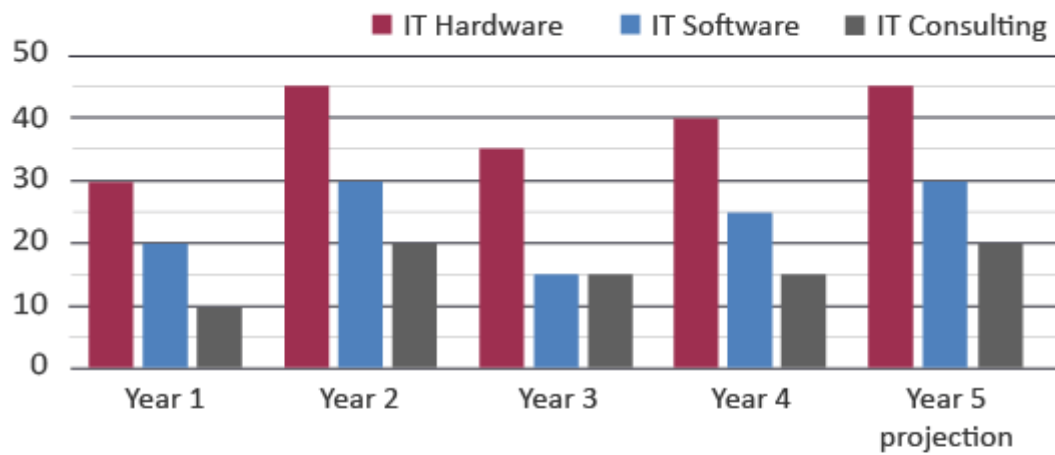
**Step 2** - Calculate the total for the year after the projected year 5. Since there is an even increase the same increase of £5 million will occur in IT hardware, software and consulting.

Total = 45 + 30 + 20 + (3 x 5) = £110 million

Thus the correct answer is (E) £110 million



## Legal Sector IT Spending (£ millions)



### Two Legal Sector IT Firms Income for Consultancy Services (10,000s)

	Make Fit Ltd	Pure Gap Plc
Year 1	290	230
Year 2	180	310
Year 3	260	300
Year 4	320	290

**Q8** For years 1 to 3 inclusive, by how much did Make Fit Ltd's income from consultancy services differ from those of Pure Gap plc?

- (A) £110 more
- (B) £110,000 less
- (C) £1,100,000 more
- (D) £110 less
- (E) £1,100,000 less

*The information that we need is shown in the graph Income for IT consultancy services.*

**Step 1** - Total the income for each company across the three years 1, 2 and 3.

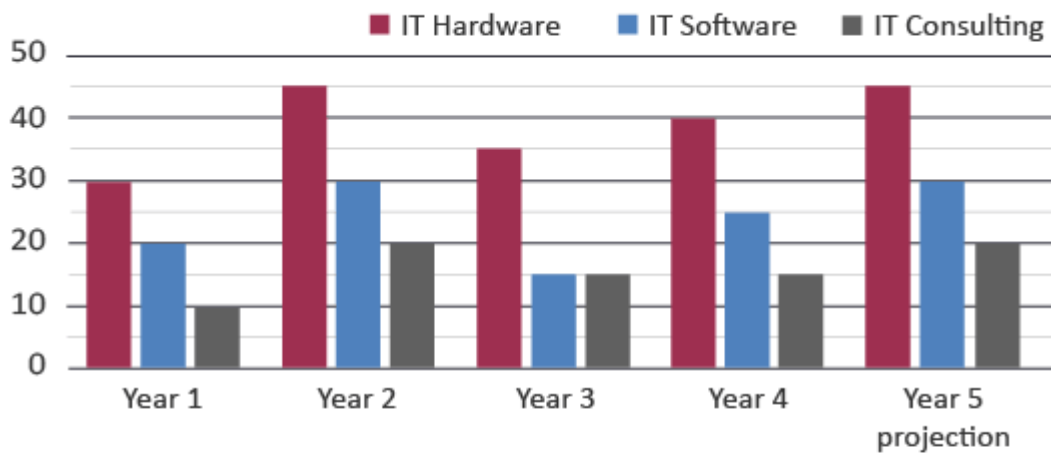
*Make Fit Ltd = 290 + 180 + 260 = 730*

*Pure Gap plc = 230 + 310 + 300 = 840*

*730 – 840 = -110 (£10,000's)*

*Thus the correct answer is (E) £1,100,000 less*

## Legal Sector IT Spending (£ millions)



### Two Legal Sector IT Firms Income for Consultancy Services (10,000s)

	Make Fit Ltd	Pure Gap Plc
Year 1	290	230
Year 2	180	310
Year 3	260	300
Year 4	320	290

**Q9** Which of the following statements is false regarding legal sector spending between Year 4 and projected Year 5?

- (A) IT consulting will increase by £5million.
- (B) IT consulting will match that of year 2.
- (C) IT software will exceed IT consulting.
- (D) Spending on IT hardware will decline.
- (E) None of these.

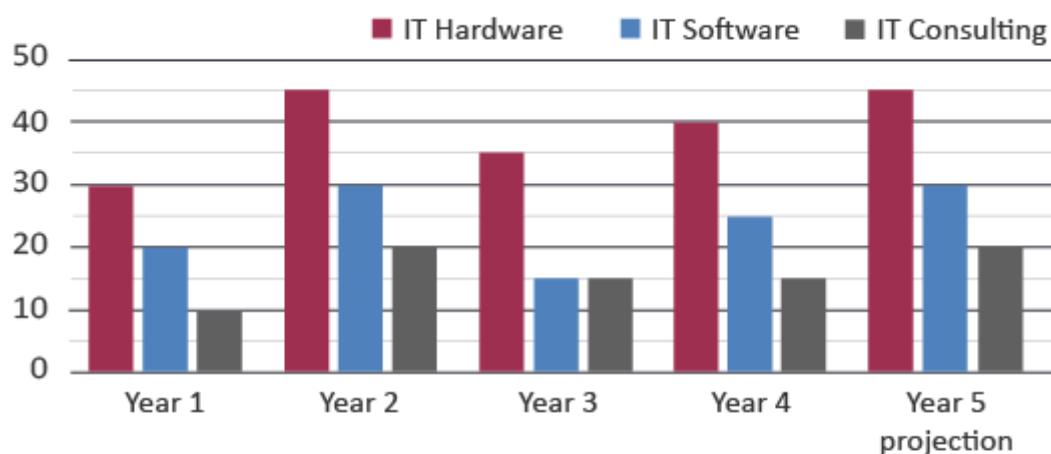
*The information that we need is shown in the graph IT spending by the legal sector.*

**Step 1** - Check in turn whether each statement is true or false:

- a) The projected spend on IT consulting is projected to increase by £5million. Option A is true.
- b) The projected spend on IT consulting is £5million, which matches year 2. Option B is true.
- c) The projected spend on IT software is £30million and for IT consulting it's £20million. Option C is true.
- d) There are increases projected for IT hardware, for IT software and for consulting. The option for D is false.
- e) We see that option D is false, so E cannot be the correct answer.

*Thus the correct answer is (D) Spending on IT hardware, software and consulting is projected to decline.*

## Legal Sector IT Spending (£ millions)



### Two Legal Sector IT Firms Income for Consultancy Services (10,000s)

	Make Fit Ltd	Pure Gap Plc
Year 1	290	230
Year 2	180	310
Year 3	260	300
Year 4	320	290

**Q10** In which year(s) did Make Fit Ltd and Pure Gap plc's combined IT consultancy income exceed £6million?

- (A) Year 1 and Year 4
- (B) Only Year 4
- (C) Year 1 and Year 3
- (D) Only Year 3
- (E) Year 3 and Year 4

*The information that we need is shown in the graph Income for IT consultancy services.*

**Step 1** - Find the total for each of the years shown and see which years exceed £6million.

*Make Fit Ltd and Pure Gap plc's combined IT consultancy income*

Year 1	$290 + 230$ (£10,000s) = £5.2 million
Year 2	$180 + 310$ (£10,000s) = £4.9 million
Year 3	$260 + 300$ (£10,000s) = £5.6 million
Year 4	$320 + 290$ (£10,000s) = £6.1 million

*Thus the correct answer is (B) Only Year 4*

## January's Sales Turnover and Profit

IKE Computers (January)	Actual (£)	Target (£)
Sales Turnover	277,350	325,000
Sales Tax (14%)	38,829	45,500
Net Turnover	238,521	279,500
Labour Costs	166,000	175,000
Other Costs	36,000	41,000
Gross Profit	36,521	63,500

**Q11** If actual labour costs rise so as to halve their difference from the target, what will be the change in actual Gross Profit?

- (A) Falls by £4,500
- (B) Rises by £4,500
- (C) No overall effect
- (D) Rises by £9,000
- (E) Falls by £9,000

**Step 1** - Halve the labour costs discrepancy against target  
 $(\text{target labour costs} - \text{actual labour costs})/2 = (175,000 - 166,000)/2 = £4,500$ .

**Step 2** - Calculate effect on Gross Profit  
 If labour costs rise by £4,500, then profit falls by £4,500.

Thus the correct answer is (A) Falls by £4,500

## January's Sales Turnover and Profit

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Other Costs	36,000	41,000
Gross Profit	36,521	63,500

**Q12** IKE Computers aim to grow monthly gross profit by 1.5%. If all costs remain constant, what will the sales turnover need to be in February to hit the target?

- (A) £242,099
- (B) £277,987
- (C) £38,555
- (D) £274,299
- (E) 288,000

**Step 1** - Calculate the required gross profit increase.  $36,521 \times 1.5\% = £547.82$ .  
Given that costs are constant, this means the Net Turnover needs to increase  
By £547.8 too. So the Net Turnover needs to be  $£547.8 + £238,521 = £239,068.8$ .

**Step 2** - We have worked out the Net Turnover, but the question asks for Sales Turnover  
(i.e. before the sales tax of 14.0% is deducted). So Sales Turnover =  $239,068.8 \div 86.0\% =$   
 $£277,986.98$ .

Thus the correct answer is (B) £277,987

## January's Sales Turnover and Profit

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Sales Tax (14%)	38,829	45,500
Net Turnover	238,521	279,500
Labour Costs	166,000	175,000
Other Costs	36,000	41,000
Gross Profit	36,521	63,500

**Q13** If IKE Computers employed eighty permanent employees in January who were on the same salary, what would have been the effect on labour costs if they had replaced twenty permanent employees with interim staff each on monthly salaries of £3,000?

- (A) Cannot tell
- (B) Decrease of £130,000
- (C) Decrease of £20,750
- (D) Increase of £2,075
- (E) Increase of £18,500

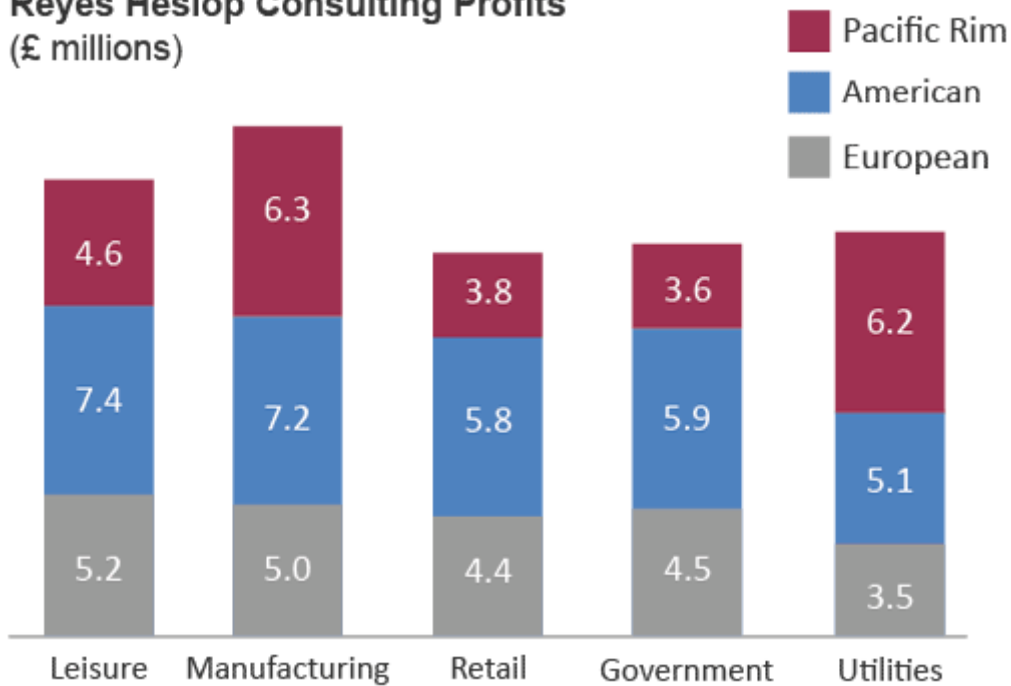
**Step 1** – Calculate the monthly cost of each full-time employee in January  
 $166,000 / 80 = 2,075$ .

**Step 2** – Calculate the difference in monthly labour costs  
 $3,000 - 2,075 = 925$ .

**Step 3** – Calculate the difference of replacing 20 full time employees with interims  
 $925 \times 20 = £18,500$ .

Thus the correct answer is (E) Increase of £18,500

### Reyes Heslop Consulting Profits (£ millions)



**Q14** Which sector represents approximately 19% of the profits from the five sectors shown?

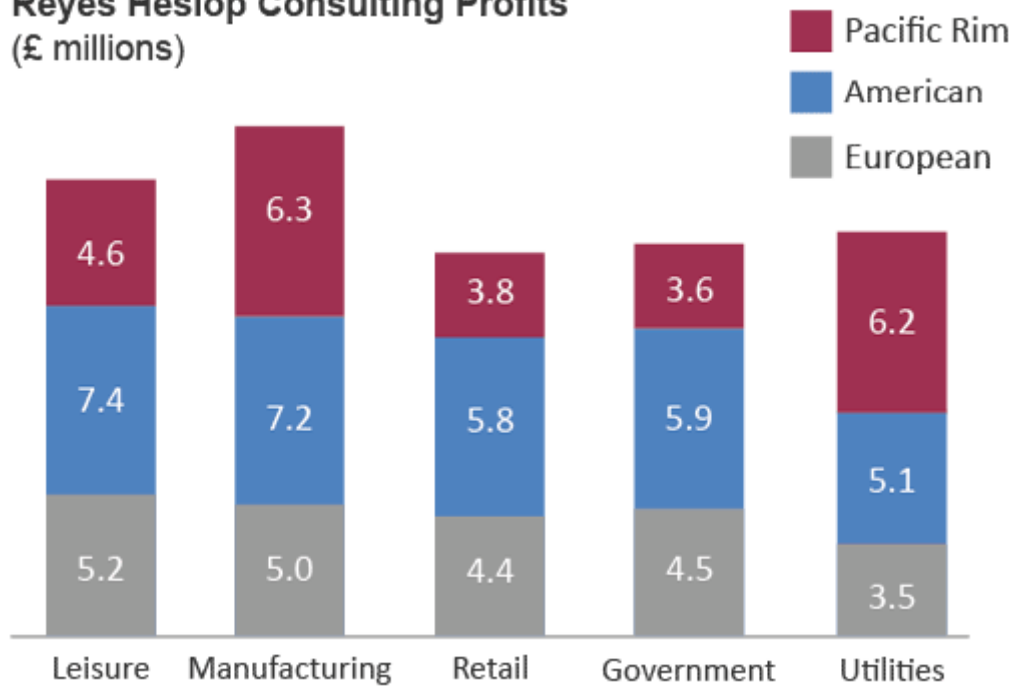
- (A) Leisure
- (B) Manufacturing
- (C) Retail
- (D) Government
- (E) Utilities

*The series of calculations is best shown in a table.*

	<b>Step 1 – calculate sum</b>	<b>Step 2 - Total</b>	<b>Step 3 - % of total</b>
<i>Leisure</i>	$5.2 + 7.4 + 4.6 = 17.2$	17.2	22%
<i>Manufacturing</i>	$5 + 7.2 + 6.3 = 18.5$	18.5	24%
<i>Retail</i>	$4.4 + 5.8 + 3.8 = 14$	14	18%
<i>Government</i>	$4.5 + 5.9 + 3.6 = 14$	14	18%
<i>Utilities</i>	$3.5 + 5.1 + 6.2 = 14.8$	14.8	19%
		<b>TOTAL = 78.5</b>	

*Thus the correct answer is (E) Utilities*

### Reyes Heslop Consulting Profits (£ millions)



**Q15** If the ratio of profit to turnover for Pacific Rim contracts was 2:15, what was the Government turnover in the Pacific Rim (in £100,000s)?

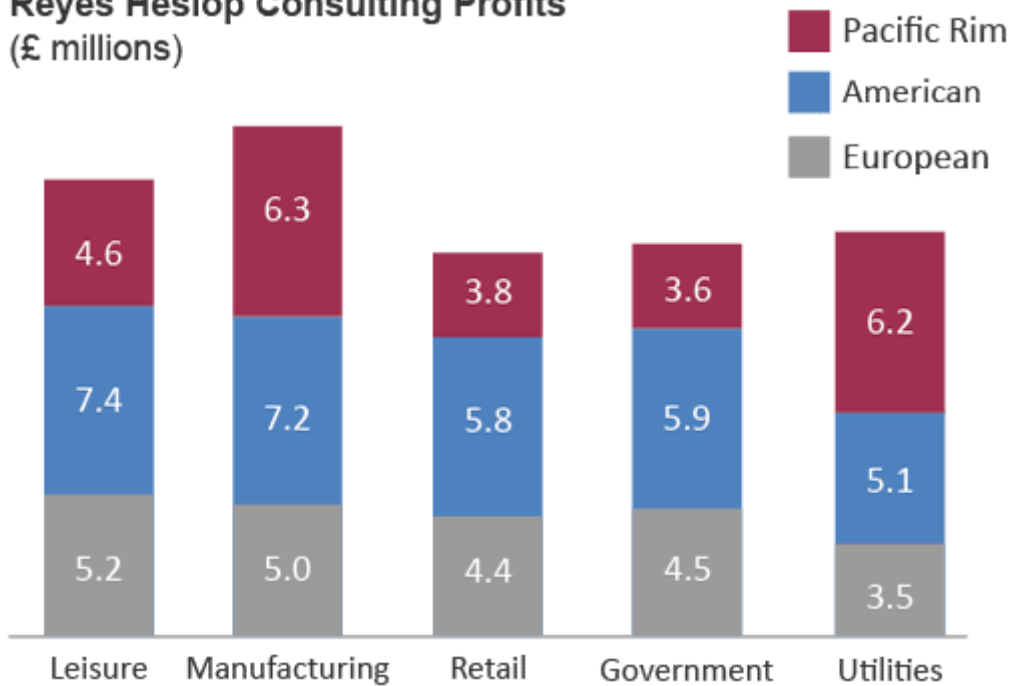
- (A) 36
- (B) 27
- (C) 270
- (D) 360
- (E) 540

**Step 1** - Contracts ratio of profit (£3.6million) to turnover = 2:15  
 Turnover = £3.6 million  $\times$  15/2 = £27 million = 270 (in £100,000s)

Thus the correct answer is (C) 270



## Reyes Heslop Consulting Profits (£ millions)



**Q16** Reyes Heslop had a target for Leisure profits to be a quarter of their total profits. Assuming profits in other areas remain the same, by how much did the Leisure profits miss this target?

- (A) £1.8 million
- (B) £2.4 million
- (C) £2.7 million
- (D) £3.2 million
- (E) £3.4 million

**Step 1** - Calculate the total Reyes Heslop profits across all areas other than Leisure.  
 $(6.3 + 7.2 + 5.0) + (3.8 + 5.8 + 4.4) + (3.6 + 5.9 + 4.5) + (6.2 + 5.1 + 3.5) = 61.3 \text{ million.}$

**Step 2** - This needs to be  $\frac{1}{4}$  of all profits for the condition to be met. Therefore all profits, across all sectors, would be  $61.3 \div 75\% = 81.7333 \text{ million.}$

**Step 3** - Now we look at the difference between actual and target Leisure profits.

Actual =  $(4.6 + 7.4 + 5.2) = 17.2$

Target =  $(81.7333 - 61.3) = 20.4333$

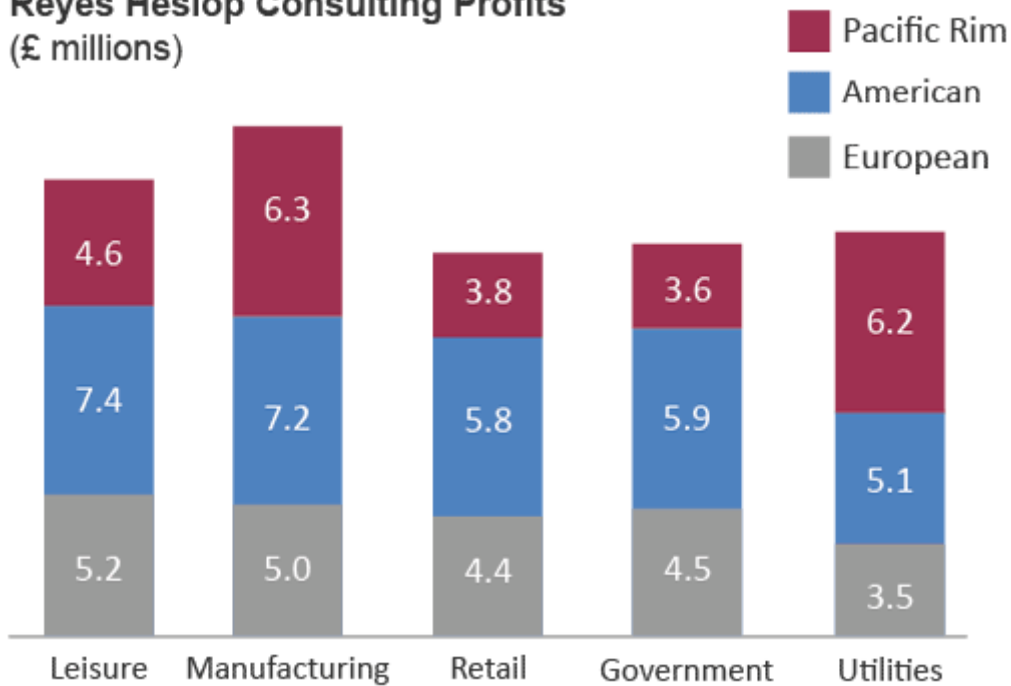
Shortfall =  $3.2333 \text{ (millions)}$

Thus the correct answer is (D) £3.2million

**Note:** the INCORRECT way of doing this question would be to:

Sum profits across all areas, calculate  $\frac{1}{4}$ , then see the difference between that figure and 17.2 million. This method would calculate  $\frac{1}{4}$  of the profits including the reduced figure from Leisure. To see this, use the figure you arrive at using this method for Leisure (19.625) and the total profits become 80.93. Which is not  $4 \times 19.625$ .

### Reyes Heslop Consulting Profits (£ millions)



**Q17** A competitor wants to takeover Reyes Heslop and offers a price of 8 times current profits. Reyes Heslop shareholders reject this offer and suggest a price that is 20% higher, what is this suggested price?

- (A) £79 million
- (B) £63 million
- (C) £628 million
- (D) £754 million
- (E) £502 million

**Step 1** - Calculate the current profits total across all sectors.

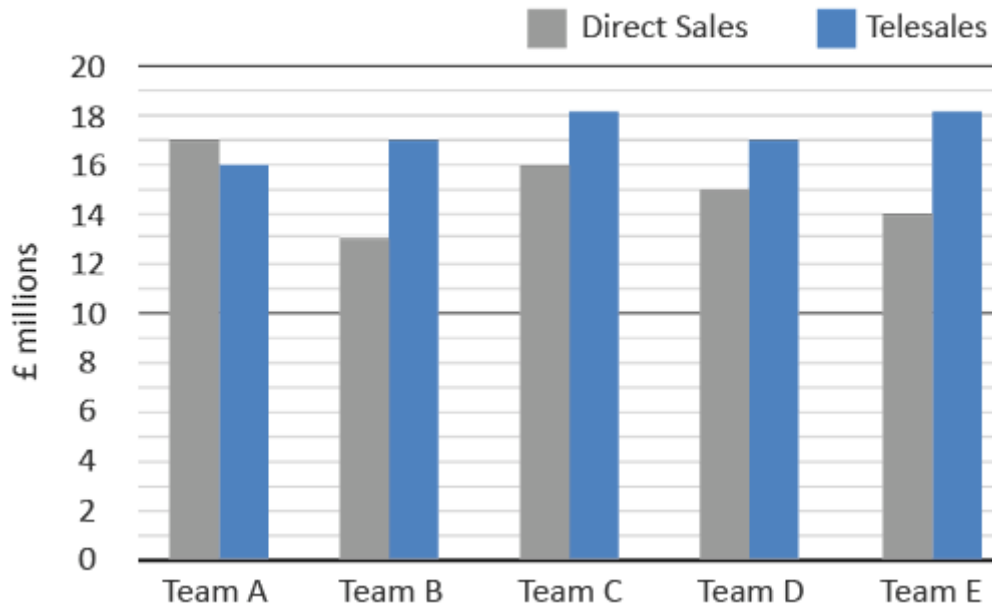
$4.6 + 7.4 + 5.2 + 6.3 + 7.2 + 5.0 + 3.8 + 5.8 + 4.4 + 3.6 + 5.9 + 4.5 + 6.2 + 5.1 + 3.5 = £78.5$  million.

**Step 2** - Takeover offer price = (£78.5 million x 8) = £628 million.

Suggested offer price = £628 x 120% = £753.6 million

Thus the correct answer is (D) £754 million

## Eastern Region's Sales - Current Year



**Q18** What is the difference between direct sales and telesales across the five teams combined?

- (A) £10 million
- (B) £11 million
- (C) £12 million
- (D) £13 million
- (E) £14 million

**Step 1** - Calculate the total direct sales and telesales across the five teams

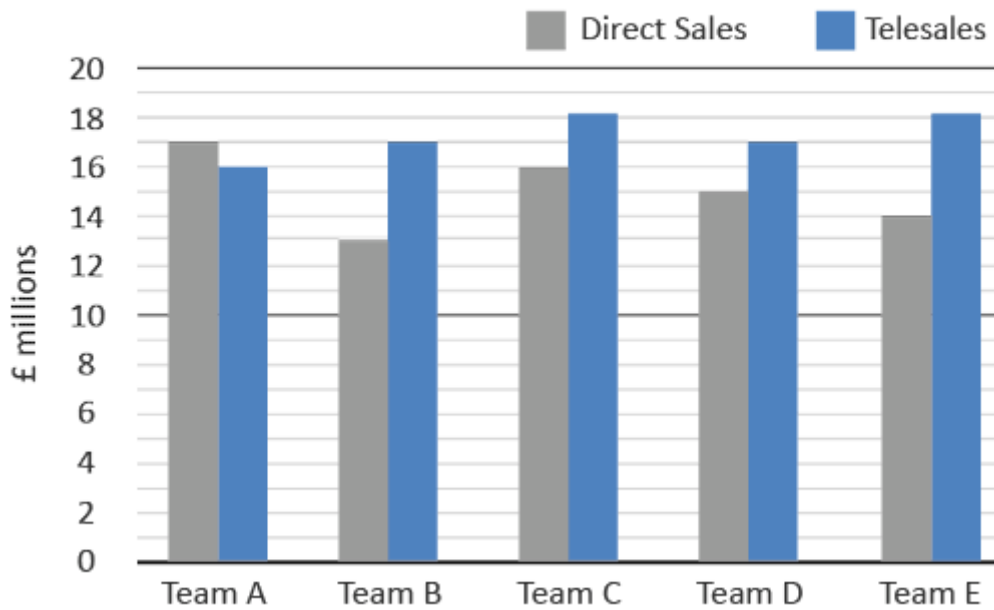
	Direct Sales	Telesales
Team A	17	16
Team B	13	17
Team C	16	18
Team D	15	17
Team E	14	18
TOTAL	75	86

**Step 2** - Calculate the difference

$$86 - 75 = \text{£11 million}$$

Thus the correct answer is (B) £11 million

## Eastern Region's Sales - Current Year



**Q19** If there are 50 direct sales and 65 telesales employees assigned to each of the Eastern region's teams A-E, what are the average sales per sales employee for the lowest performing team in terms of overall sales (to the nearest £10,000)?

- (A) Cannot tell from the data
- (B) £200,000 (direct); £340,000 (telesales)
- (C) £260,000 (direct); £260,000 (telesales)
- (D) £340,000 (telesales); £200,000 (direct)
- (E) £20,000 (direct sales); £30,000 (telesales)

**Step 1** - Obtain the lowest performing team from calculating the overall sales (direct sales and telesales combined)

Team A total = 33

Team B total = 30

Team C total = 34

Team D total = 32

Team E total = 32

So, Team B is the lowest performing team overall.

**Step 2** - Calculate the average sales per direct sales employee

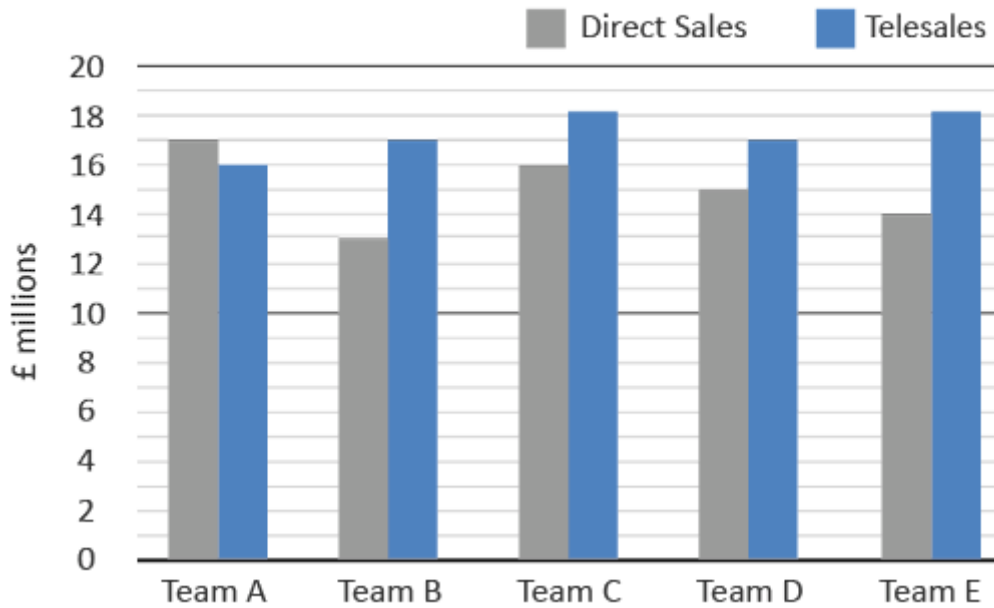
$13/50 = 0.26$  million

**Step 3** - calculate the average sales per telesales sales employee

$17/65 = 0.26$  million

Thus the correct answer is (C) £260,000 (direct sales); £260,000 (telesales)

## Eastern Region's Sales - Current Year



**Q20** If the Eastern Region's total sales represent 26% of the total for all regions, what are the total sales across all regions (to the nearest £million)?

- (A) £124 million
- (B) £142 million
- (C) £161 million
- (D) £619 million
- (E) £620 million

**Step 1** - Calculate the total sales

86 (for telesales) + 75 (for direct sales) = £161 million

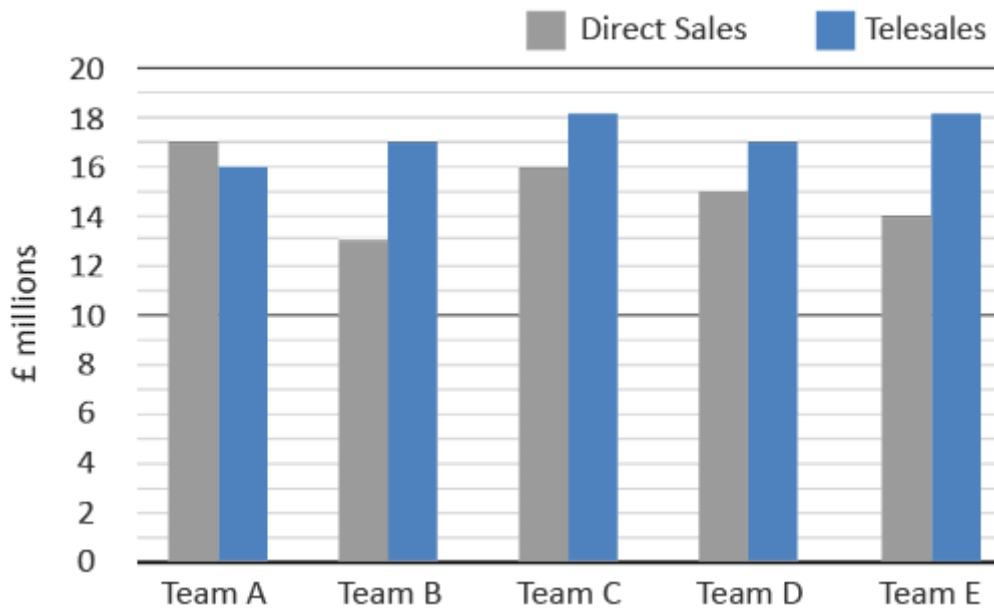
**Step 2** - Calculate the total sales across all regions

£161 million = 26%

100% =  $161 \times 100/26 = £619.23$  million

Thus the correct answer is (D) £619 million

## Eastern Region's Sales - Current Year



**Q21** What are the total sales targets for next year across all five teams if the target is set as a 20% and 10% increase in this year's Direct Sales and Telesales respectively?

- (A) Direct (£75 million); Telesales (£86 million)
- (B) Direct Sales (£104 million); Telesales (£82 million)
- (C) Direct (£82 million); Telesales (£104 million)
- (D) Direct (£95 million); Telesales (£90 million)
- (E) Direct (£90 million); Telesales (£94.6 million)

**Step 1** - Calculate the increase in the direct sales and telesales totals, as follows:

Direct Sales	Telesales
17	16
13	17
16	18
15	17
14	18
<b>Total</b> 75	86
$75 \times 120\% = 90$	$86 \times 110\% = 94.6$

Thus the correct answer is (E) Direct Sales (£90 million); Telesales (£94.6 million)

-- *End of Free Test* --

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