MyConsultingCoach Problem Solving Test

Free Practice Test

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Practice Test Overview and Instructions

This practice test has been developed to provide a sample of the actual McKinsey Problem Solving Test used for selection purposes. This test assesses your ability to solve business problems using deductive, inductive, and quantitative reasoning. This practice case contains a total of 10 questions and should be completed in 24 minutes. The actual test contains 26 questions and you will be given 60 minutes to answer as many questions as possible.

Similar to the real test, this test contains an answer sheet at the end. Make sure to allocate enough time to transfer all your answers to the answer sheet. The answer sheet will be the only document used to assess your performance, any answer present in the booklet but not in the answer sheet will not contribute to your final score.

While completing this practice test, do not use any electronic devices (e.g., calculator, computer) when performing calculations to answer the questions. Electronic devices will not be permitted to be used during the actual test administration. Also, during the actual test administration, you may use all blank space in the test booklet as scratch paper to assist you in performing any calculations and recording any notes. No scratch paper will be allowed.

The practice scenarios begin on the next page of this booklet. Only consider information contained within the scenario when determining your answer. Considering all information presented within the scenario is critical to answering questions correctly.

After you have completed the test, score your answers using the answer key located at the end of this booklet. Add the number of correct answers to determine you final total score.

> If you feel you need more practice, on My Consulting Coach you can find 3 **26-questions complete Tests**, our **Performance Radar** to cut the time you need for preparation and our **PST Guide** with tips&tricks to save at least 10 minutes on the test day.
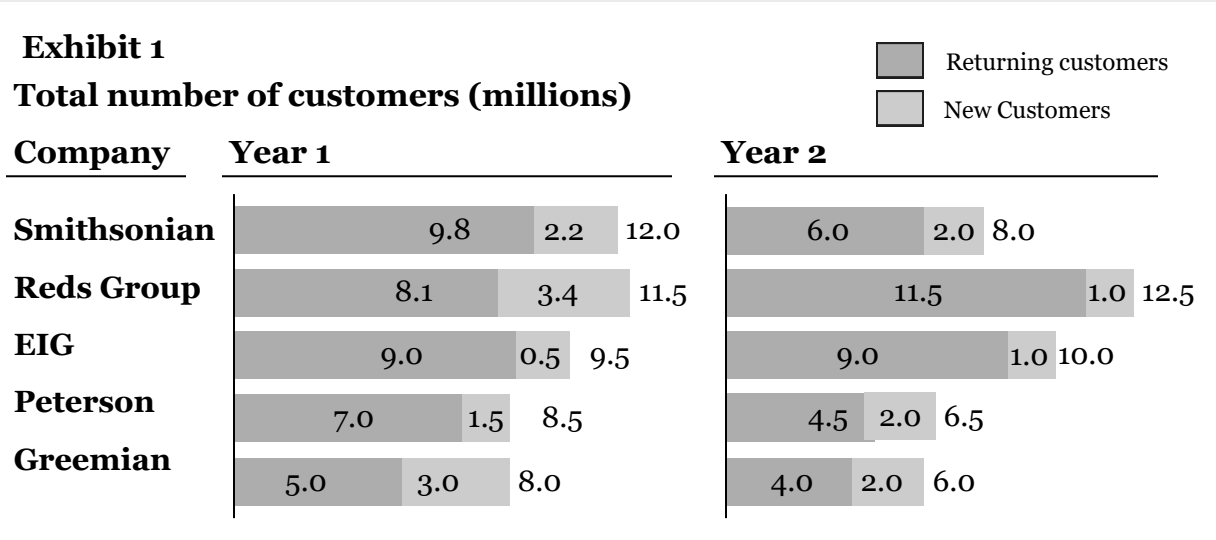
The Peterson Insurance Company

The Peterson insurance company provides **Vehicle insurance** (also known as car insurance, or motor insurance) for cars, trucks, motorcycles, and other road vehicles. Its primary use is to provide financial protection against physical damage and/or bodily injury resulting from traffic collisions and against liability that could arise for damage to someone else's property or injury to other persons resulting from an accident.

Globally recognized as one of the most reliable insurance brands, Peterson has seen a strong growth in market share for the last five years. However, recently Peterson's customer numbers have plateaued, resulting in slower sales and profit growth.

Tom Peterson, the CEO, has asked the board of directors to provide an explanation and possible solutions for stagnating revenues. Mr. Pace, the Sales Manager, identified declining customer satisfaction as the root cause and proposed to increase the numbers of claim handlers to better match customer needs. Mr. Peterson is skeptical of this proposal and afraid that increasing the headcount as the only solution may lead to higher costs affecting overall profitability and limit flexibility on pricing. Your team has been called to support Mr Peterson in his analysis and main decisions going forward.

Initially, your manager recommended focusing on understanding the trends in customer choices among the top five insurers. Exhibit 1 shows the breakdown of the customer base between new and returning customers among the five main insurers in the market over the last 2 years.

Exhibit 1
Total number of customers (millions)

Returning customers
New Customers

Company	Year 1			Year 2		
Smithsonian	9.8	2.2	12.0	6.0	2.0	8.0
Reds Group	8.1	3.4	11.5	11.5	1.0	12.5
EIG	9.0	0.5	9.5	9.0	1.0	10.0
Peterson	7.0	1.5	8.5	4.5	2.0	6.5
Greemian	5.0	3.0	8.0	4.0	2.0	6.0

1. Which of the following most accurately describes the key rationale for Mr. Peterson's decision to hire your team?

    A. Finding levers to increase customer satisfaction without increasing costs

    B. Identifying plans to grow revenues without increasing the headcount

    C. Creating plans to grow revenues after identifying root causes of current stagnation

    D. Creating consensus among senior management over a set of initiatives not affecting the cost base

2. The retention rate is given by the percentage of customers from the previous year an insurance company is able to retain. Which of the following is closer to Peterson's retention rate in year 2?

    A. 53%

    B. 69%

    C. 76%

    D. 22%

3. Which of the following statements about year 3 can be inferred from information in Exhibit 1?

    A. If in year 3 Smithsonian sees its total customers decrease at the same rate as in year 2 and adds 1.6 million new customers, the total number of returning customers will be 3 million

    B. If in year 3 Greemian maintains the same retention rate and the same percentage of new customers to total customers as in year 2, it will have 4.5 millions customers

    C. Assuming that all companies maintain the same retention rate in year 3, EIG will have the highest share of returning customers

    D. In year 3 Peterson will have the highest share of new customers out of total customers

The CEO Tom Peterson asked the team to investigate the drivers retention rate, to find out how to best address the problem. Your team discovered that 80% of the customers who left Peterson did so after experiencing a car accident. Your team analyzed the journey of the customer experiencing an accident and identified three critical points affecting customer satisfaction:

A   Speed in handling of the claim: How quick the insurance processed the refund
B   Training and availability of contact center: hours and training of personnel
C   Extensive network of body shops

The CEO asked the team to start by analyzing in detail the effect of speed in claim handling focusing on Rolgania, one of the most critical regions.

Exhibit 2 shows the breakdown of new and returning customers for year 1 and year 2. Exhibit 3 shows the dropout rate, i.e. the percentage of customers experiencing a claim who then decide to leave the company, based solely on the speed in handling the claim (measured in days).

Exhibit 2

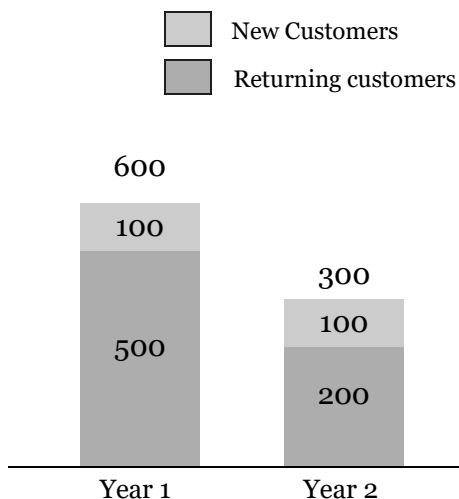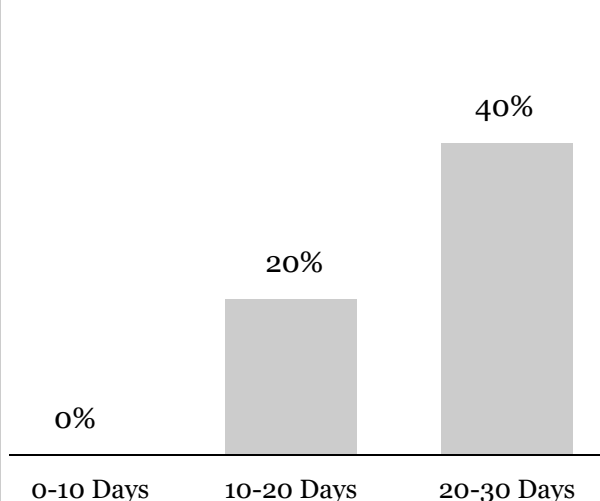Total number of customers (thousands) for Rolgania region

New Customers
Returning customers

	Year 1	Year 2
Total	600	300
New Customers	100	100
Returning customers	500	200

Exhibit 3

Dropout rate (percent) based on speed in handling the claims (days)

0-10 Days	10-20 Days	20-30 Days
0%	20%	40%

4. How many people in Rolgania left Peterson between Year 1 and Year 2 WITHOUT experiencing a car accident?

    A.   60

    B.   80

    C.   40

    D.   320

5. Out of the customers who left Peterson in year 2 after experiencing a car accident, 50% had their claims handled on average in 15 days and the other 50% on average in 22 days. What percentage of the drop out (total number of people who left Peterson) in year 2 is due to low speed of claim handling?

    A.   6%

    B.   15%

    C.   24%

    D.   30%

6. Which of the following would be LEAST useful to analyze speed of claim handling and find root causes?

    A.   A "Day in life of a claim handler" analysis, outlining key actions performed, delays and bottlenecks in the process

    B.   An analysis of team incentives and motivation at Secure Online, an online insurer who just entered the market

    C.   A skill variability analysis, showing how skills vary across the claim handling team

    D.   A "touch time" analysis, with the breakdown of total claim handling time by different actors involved through the process (e.g. body shop, agency, call center)
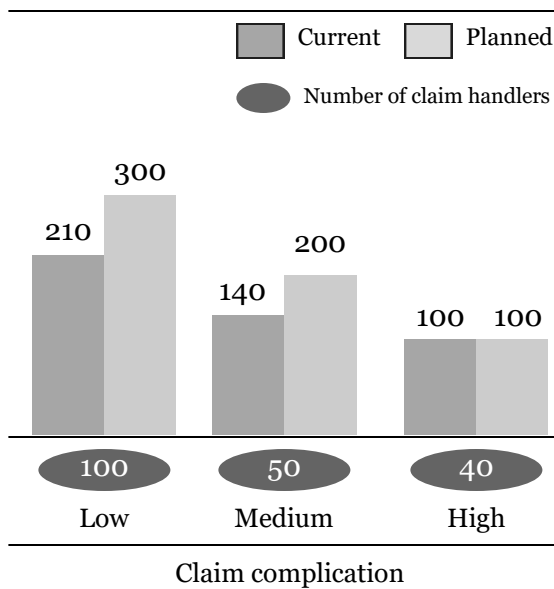
Your team has identified the key root causes for low productivity of claim handlers and proposed a plan which could dramatically increase the productivity of claim handlers in simple claims. The CEO was happy with the new plan, even if he considered bringing changes to an established process a daunting challenge. Top management strongly opposed to the plan, with two main objections:

- Increasing productivity by altering an established process could increase total payout to customers for claims. If instead more claim handlers were hired, key processes would be kept under control

- The increase in productivity is hardly a valuable asset in the claim handling department since it is almost entirely in the low complication claims, where the dropout rate is already close to zero

Exhibit 4 shows the expected impact of the productivity increase plan prepared by your team. Exhibit 5 shows the dropout rate of customers according to complication of the claim. Each customer had no more than a single claim.

Exhibit 4

Productivity by claim complication
(claims per year)

| Current | Planned |

Number of claim handlers

300	
210	
	200
140	
	100 100

| 100 | 50 | 40 |
| Low | Medium | High |

Claim complication

Exhibit 5

Number of claims (thousands) and dropout rate (percent) by claim complication

Drop out rate

15		
	10	
		5

| 0% | 20% | 40% |
| Low | Medium | High |
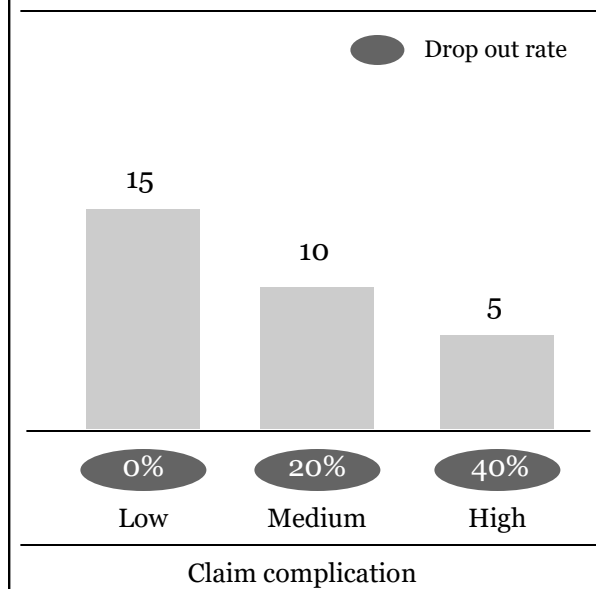
Claim complication

7. Which assumptions are the underlying reason for opposition against the proposed plan by the senior managers?

1. It is impossible to move claim handlers from managing "low" complication claims to other types of claims and vice versa.

2. Increasing total payout will generate a loss exceeding the savings from high retention rate.

3. Training new hires to existing processes would be more cost-effective in terms of total payout compared to changing the processes for existing claim handlers.

4. Boosting productivity always implies a surge in the average payout per claim handler.

5. Adding new claim handlers will not change the average payout per claim handler.

A. 1 and 2

B. 4 and 5

C. 3 and 5

D. 1 and 3

8. According to the CURRENT level of productivity by claim type, how many additional claim handlers should be hired to handle the annual inflow of claims within the year?

A. 31

B. 32

C. 60

D. 61

9. According to the PROPOSED plan and assuming that claim handlers are moved to different type of claims to maximize coverage of all claims (at the productivity rate for that specific type of claim), how many claim handlers are left idle?

    A.   No claim handler is left idle

    B.   10

    C.   40

    D.   50

10. What is the maximum allowable increase in total payout for a given year according to the proposed plan if the drop out rate falls by 50% at all levels of complication and the average margin on customers dropping out is 500 $ per year?

    A.   200,000

    B.   1,000,000

    C.   2,000,000

    D.   15,000,000

Answer sheet

Question	Your answer
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

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Solutions

1   C

Identify the CEO's concern: the CEO asked the board of directors (before) and your team (now) to provide explanation for "stagnating revenues". Different questions outline different problems that Mr. Peterson is trying to solve:

A. Customer satisfaction – wrong, considered as the CAUSE of stagnating revenues by a manager

B. Revenue growth

C. Revenue growth

D. Consensus among management – wrong, not relevant to the revenue problem

This helps us to eliminate 2 of the 4 questions that state objectives different from revenue.

Peterson's view about headcount is stated to explain the reason why he is skeptical about Mr. Pace's opinion about solving the company's issue just by increasing headcount. Moreover the text does NOT state whether Mr. Peterson agrees with Mr. Pace's analysis that customer satisfaction is the main cause of revenue stagnation. This eliminates answer B and leaves answer C, which is consistent with the stated goal of the CEO: providing explanation for stagnating revenue by identifying root causes and develop plans to growth top line.

2   A

Understand the definition of retention rate:

$$\text{Retention rate} = \frac{\text{Returning customers (years 2)}}{\text{Total customers (year 1)}}$$

Where *Total customers (year 1) = Returning customers (year 1)+ New customers (year 1)*

Understand the math : 4.5 / 8.5 = 53%. If you read the answers before reading the question following our method, you won't need to complete any calculation, just to know that the result is slightly more than 50% but for sure less that 69%.

3   B

Skimming through the answers helps you to immediately identify that answer D, differently from all other answers, is not based on any fact based assumptions. Therefore eliminate D.

Go through all other questions quickly simplifying the math

A.   Total customers for Smithsonian decreased by 1/3 (~30%) from 12 to 8. Another~30% decrease would bring them to ~5.6 (70%*8). If new customers are 1.6 mn, repeating customers must be ~4 mn, not 3 mn. INCORRECT

B.   Greemian retention rate is

$$\text{Retention rate} = \frac{\text{Returning customers (years 2)}}{\text{Total customers (year 1)}}$$

Therefore 4/8, or 50%. Therefore,

*Returning customers (year 3) = Total customers (year 2) * 50% = 3 mn*

Returning customer will be the same share of total as in year 2, so 4/6=2/3 or ~67%. New customers will be the remaining part so 100%-67%=~34%. So, they will be about 50% of the returning customers, i.e. 50%*3=1.5mn. Hence total customers will be 4.5 mn. CORRECT

C.   EIG retention rate is 9/9.5, which is intuitively lower than Reds, 11.5/11.5. INCORRECT

4   B

As in all questions, follow our method, reading questions, skimming answers and then going to the text. Text says that "80% of the customers who left Peterson did it after experiencing a car accident". Therefore 20% dropped out without experiencing a car accident.

Total number of customers dropping out will are given by:

Customers dropping out (year 2) = Total customers (year 1) — returning customers (year 2)

Hence customers dropping out will be 600-200=400, 20% of which left without experiencing any accident, so 20%*400=80.

5   C

First, calculate the drop out rate for customers who had a car accident: half the customers had their claims handled in 15 days and half in 22 days. Compare the results in Exhibit 3: drop out rate for claims handled in 10-20 days is 20%, while for claims handled in 20-30 days is 40%. Since exactly half the customers belong to the 10-20 days cohort and the other half to the 20-30 days, result will be the average between 20% and 40%, i.e. 30% of the customers who experienced a car accident.

Second, weight the results by the share of customers who had a car accident (80%) out of the total customers who left Peterson. The denominator should not be the only customers who left Peterson after experiencing a car accident, but total customers who left Peterson. Therefore, 30% should be weighted by 80%, getting to 24% of total customers.

6   B

Carefully read the question: the focus is understanding the causes of underperformance in speed of claim handling. This question asks you to identify the LEAST relevant answer, which is different from not relevant. In other words all answers will be somehow relevant to the topic. Think about this type of questions in terms of prioritization (or de-prioritization): if you had to choose which piece of analysis would you drop? In order to quickly identify the right answer you should understand how relevant are the proposed answers for the stated objectives:

A   Relevant, identifies causes of slowdowns (bottlenecks)

B   Relatively relevant: focuses on analyzing only one of the many drivers of performance in a different company with a different business model (online insurance).

C   Relevant, focuses on difference in skills among claim handlers as a possible explanation of the average/total underperformance

D   Relevant, takes into account all actors involved in the process

7   D

In this question, you should examine quickly whether answers are supported by evidence in the text. Pay attention to distinguish between what managers must have assumed, what they would better have assumed (but did not assume) and what did not assume at all (for good reasons). Only the statements in the first bucket are correct. If short on time, if you are certain that e.g. statement 1 is true, narrow down your analysis to statements 2 and 3, the only ones matched with statement 1 in the answers. Below an analysis of all statements:

1. Managers must have assumed that handlers cannot be moved in order to state that the increase in productivity would be useless, given that it is mostly in low complication claims. If the opposite was true the increase in productivity could be used to move claim handlers across claims of different complication. CORRECT

2. Managers should have considered the net impact (delta between additional revenue from high retention rate or avoiding drop out and the cost of additional employees). However there is no clue in the text that they made such estimates. INCORRECT

3. Managers must have made this assumption, explained in the first reason for their opposition to the plan. The text states clearly that increase in payout would come from "altering processes" and it adds that hiring additional claim handlers would help keeping processes under control. CORRECT

4. Managers claim that increasing productivity COULD lead to higher payoffs, in other words it is not a rule as the "always" would suggest. INCORRECT

5. Managers claim that hiring additional claim handlers would not negatively affect total payout as much as increasing productivity according to the team's plan. However they do not clearly rule out any negative effect. INCORRECT

8   B

The most time efficient way to solve it is to first map demand and supply, second convert the unmet demand by claim type in number of additional claim handlers reusing using the CURRENT productivity levels.

Type of claim	Demand # of claims	Productivity Claims/year/ handler	Claim handlers #	Supply # of claims	Delta # of claims
Low complication	15,000	210	100	21,000	+6,000
Medium complication	10,000	140	50	7,000	-3,000
High complication	5,000	100	40	4,000	-1,000

Since there is NO assumption about the possibility of moving claim handlers to different claim types, we will not be able to leverage the oversupply in low complication claims in reducing excessive demand in other claim types. Therefore we simply have to convert the excessive demand in claim handlers, considering that if we get a decimal number we should take the next integer (since fractions of employees are not available): 22 (3,000 / 140 = 21.4) for medium complication claims and 10 (1000 / 10) for high complication claims.

9   C

The key assumption of this question is that "claim handlers are moved to different type of claims to maximize coverage of all claims". The most time efficient way to solve it is to first map demand and supply, second find out that some excessive demand in a type of claim can be compensated with oversupply in another type of claims, and third, convert the outstanding oversupply in number of claim handlers

Type of claim	Demand *# of claims*	Productivity *Claims/year/* *handler*	Claim handlers *#*	Supply *# of claims*	Delta *# of claims*
Low complication	15,000	300	100	30,000	+15,000
Medium complication	10,000	200	50	10,000	0
High complication	5,000	100	40	4,000	-1,000

50 claim handlers are left idle from the low complication claims (15,000 / 300 = 50), 10 of which will be moved to high complication claims (1,000 / 100 = 10). Total number of claim handlers left idle will be 50 − 10 = 40.

10   B

Read the question carefully: when the questions says "allowable increase" it means what changes in some variables will enable us to land exactly in the same situation (profitability) as we are now. More specifically the question is asking how much more costs (total payout) will the company be able to bear, given the 50% decrease in drop out.

Calculate the net effect vs. today of the decrease in drop out by identifying the delta in total margin between the existing and future drop out rate

Type of claim	Demand #of claims	Current drop out rate %	Future drop out rate %	Delta customers dropping #	Avg. margin $	Delta total margin $
Low complication	15,000	0%	0%	0	500	0
Medium complication	10,000	20%	10%	1,000	500	500,000
High complication	5,000	40%	20%	1,000	500	500,000

Additional revenue corresponding to 50% of total revenues on medium and high complication claims (drop out for low complication was already 0%) generate 1,000,000.

Answers

Question	Answer	Your answer
1	C	
2	A	
3	B	
4	B	
5	C	
6	B	
7	D	
8	B	
9	C	
10	B	

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