Free Numerical Reasoning Test

20 questions with a worked solution for every one

This is a full-length practice test. Work through it under exam conditions if you can: give yourself 20 minutes and avoid checking the answers as you go. Every question is multiple choice with exactly one correct answer.

The worked solutions start after the last question. They show the method step by step and explain every wrong option, so a question you get wrong tells you something.

Questions	20
Suggested time limit	20 minutes
Format	Multiple choice, four options
Answers	Included, with full worked solutions

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Written by Guy Thornton. Updated 19 July 2026.

Questions

QUESTION 1 OF 20

By what percentage did the North region's revenue increase from Q1 to Q2?

Regional revenue for a courier firm, Q1 and Q2

Region	Q1 revenue (£)	Q2 revenue (£)
North	240,000	276,000
South	180,000	189,000
West	150,000	141,000
Total	570,000	606,000

A) 6.3%
B) 13.0%
C) 15.0%
D) 36.0%

QUESTION 2 OF 20

What percentage of all staff in 2024 worked in the IT department?

Headcount by department, 2023 and 2024

Department	Staff 2023	Staff 2024
Operations	48	54
Sales	32	30
Finance	12	15
IT	28	33
Total	120	132

A) 22.7%
B) 23.3%
C) 25.0%
D) 27.5%

QUESTION 3 OF 20

A distribution centre splits 4,900 parcels between three depots in the ratio 3:4:7. How many parcels does the largest depot receive?

A) 350
B) 1,050
C) 1,400
D) 2,450

QUESTION 4 OF 20

A delivery van consumes 8.5 litres of fuel per 100 km. How much fuel will it use on a 340 km route?

A) 25.5 litres
B) 28.9 litres
C) 34.0 litres
D) 40.0 litres

QUESTION 5 OF 20

A bottling machine fills 45 bottles per minute. Running continuously, how many bottles does it fill in 2 hours and 20 minutes?

A) 5,400
B) 5,940
C) 6,300
D) 6,750

QUESTION 6 OF 20

Which site recorded the largest percentage change in electricity use from 2023 to 2024, counting increases and decreases alike?

Annual electricity use by site (MWh)

Site	2023 (MWh)	2024 (MWh)
Site A	2,400	2,160
Site B	800	900
Site C	1,500	1,620
Total	4,700	4,680

A) Site A
B) Site B
C) Site C
D) Site A and Site B changed by the same percentage

QUESTION 7 OF 20

A supplier invoices €4,680. The exchange rate is £1 = €1.17 and the company's bank adds a 2.5% conversion fee to the sterling amount. What is the total cost in pounds?

A) £3,900.00
B) £4,000.00
C) £4,100.00
D) £5,475.60

QUESTION 8 OF 20

What is the total gross profit across all three products?

Sales, price and cost by product for the last quarter

Product	Units sold	Unit price (£)	Unit cost (£)
Widget A	1,200	18.00	12.50
Widget B	850	24.00	15.00
Widget C	640	32.50	21.00

A) £26.00
B) £21,610
C) £41,190
D) £62,800

QUESTION 9 OF 20

Three printing machines produce 7,200 flyers in 4 hours. Working at the same rate, how long would five machines take to produce 13,500 flyers?

A) 1.5 hours
B) 4.5 hours
C) 5.625 hours
D) 7.5 hours

QUESTION 10 OF 20

After a 12% discount, a maintenance contract costs £30,800. What was the price before the discount?

A) £27,104
B) £34,496
C) £35,000
D) £39,200

QUESTION 11 OF 20

On which day did the contact centre handle the highest number of calls per agent hour?

Calls handled and agent hours worked, one week

Day	Calls handled	Agent hours
Monday	1,344	96
Tuesday	1,215	90
Wednesday	1,302	93
Thursday	1,160	80
Friday	1,020	68

A) Monday
B) Wednesday
C) Thursday
D) Friday

QUESTION 12 OF 20

What is the combined value of the three invoices in pounds?

Outstanding supplier invoices and the exchange rate applying to each

Supplier	Invoice amount	Currency	Exchange rate (units per £1)
Supplier P	5,400	EUR	1.20
Supplier Q	8,190	USD	1.30
Supplier R	3,300	CHF	1.10

A) £13,800
B) £14,075
C) £16,890
D) £20,757

QUESTION 13 OF 20

A team of 24 people earns an average salary of £38,500. Next year headcount rises by 25% and the average salary rises by 4%. What will the total salary bill be?

A) £960,960
B) £1,155,000
C) £1,191,960
D) £1,201,200

QUESTION 14 OF 20

What percentage of the fleet's total annual mileage is driven by HGVs? Give your answer to one decimal place.

Fleet composition and annual mileage per vehicle

Vehicle type	Number of vehicles	Annual mileage per vehicle
Small van	42	18,000
Large van	25	24,000
HGV	8	46,000

A) 10.7%
B) 21.3%
C) 34.8%
D) 52.3%

QUESTION 15 OF 20

A conveyor belt runs at 1.2 metres per second. How far does a package travel on it during a continuous 8-hour shift?

A) 0.576 km
B) 9.6 km
C) 34.56 km
D) 345.6 km

QUESTION 16 OF 20

Assuming no new subscribers join, what will total monthly subscription revenue be after one month of churn?

Subscriber numbers, pricing and monthly churn by tier

Tier	Subscribers	Monthly fee (£)	Monthly churn
Basic	4,000	9.00	3%
Standard	2,500	18.00	2%
Premium	900	35.00	1%

A) £109,125
B) £110,205
C) £112,500
D) £114,795

QUESTION 17 OF 20

By what percentage did the average selling price per unit change from February to March?

Units sold and revenue by month

Month	Units sold	Revenue (£)
January	1,250	43,750
February	1,400	47,600
March	1,320	46,860

A) 1.4% increase
B) 1.6% decrease
C) 4.2% increase
D) 4.4% increase

QUESTION 18 OF 20

Two depots share an annual delivery cost of £96,000 in the ratio 7:5. Next year the larger depot's share rises by 15% while the smaller depot's share falls by 8%. What will the combined cost be?

A) £99,360
B) £101,200
C) £102,720
D) £110,400

QUESTION 19 OF 20

The lowest annual energy cost per square metre of floor area across the three sites is closest to which figure?

Floor area, annual energy use and electricity tariff by site

Site	Floor area (m²)	Annual energy use (kWh)	Tariff (pence per kWh)
Site A	2,400	288,000	24.0
Site B	1,800	252,000	22.5
Site C	3,200	320,000	30.0

A) £25.50 per m²
B) £28.80 per m²
C) £30.00 per m²
D) £31.50 per m²

QUESTION 20 OF 20

A fund of £250,000 grows by 6% in year one, falls by 5% in year two, then grows by 8% in year three. What is its value at the end of year three?

A) £251,750
B) £271,890
C) £272,500
D) £286,200

Answers and worked solutions

Every wrong option is explained too, not just the correct answer.

Question 1

Correct answer: C) 15.0%

The increase is £276,000 - £240,000 = £36,000. Percentage change always uses the starting value as the base, so divide by the Q1 figure: 36,000 ÷ 240,000 = 0.15, which is 15.0%. Dividing by the Q2 figure instead gives 13.0%, and dividing by the Q1 total of £570,000 gives 6.3%. Both use the wrong base. Reading the £36,000 increase itself as the percentage gives 36.0%; the size of a change in pounds and the percentage it represents are different quantities.

Question 2

Correct answer: C) 25.0%

IT had 33 staff in 2024 out of a 2024 total of 132. So 33 ÷ 132 = 0.25, which is exactly 25.0%. Reading down to the wrong row and using the Sales 2024 figure gives 30 ÷ 132 = 22.7%. Using the 2023 IT figure over the 2023 total gives 28 ÷ 120 = 23.3%, and mixing the years by taking 33 ÷ 120 gives 27.5%. The numerator must come from the IT row, and both figures must come from the same year.

Question 3

Correct answer: D) 2,450

Add the ratio parts: 3 + 4 + 7 = 14 parts in total. One part is 4,900 ÷ 14 = 350 parcels. The largest share is 7 parts, so 7 × 350 = 2,450 parcels. The other two depots receive 3 × 350 = 1,050 and 4 × 350 = 1,400, and those three figures sum back to 4,900 as a check. Answering 1,050 or 1,400 means reading off one of the smaller depots, and answering 350 means stopping at the value of a single part instead of multiplying it by the 7 parts the question asks about.

Question 4

Correct answer: B) 28.9 litres

The route is 340 ÷ 100 = 3.4 units of 100 km. Multiply that by the consumption rate: 3.4 × 8.5 = 28.9 litres. A common slip is to divide instead of multiply, giving 340 ÷ 8.5 = 40.0 litres, which would be the answer only if the van travelled 8.5 km per litre rather than using 8.5 litres per 100 km. Rounding the 3.4 units of 100 km to a whole number produces the other two options: 3 × 8.5 = 25.5 litres if you round down, and 4 × 8.5 = 34.0 litres if you round up. The 0.4 has to be kept.

Question 5

Correct answer: C) 6,300

First convert the time to a single unit: 2 hours is 120 minutes, plus 20 minutes gives 140 minutes. Then multiply by the fill rate: 140 × 45 = 6,300 bottles. Working in whole hours only (120 minutes) gives 5,400 and misses the extra 20 minutes. Writing the time as "2.20 hours" and treating that as a decimal gives 2.2 × 60 = 132 minutes and so 132 × 45 = 5,940, but 20 minutes is a third of an hour, not two tenths. Rounding the time up to 2.5 hours, or 150 minutes, gives 150 × 45 = 6,750.

Question 6

Correct answer: B) Site B

Percentage change is measured against the starting year, so every base here is the 2023 figure. Site A: 240 ÷ 2,400 = 10.0% decrease. Site B: 100 ÷ 800 = 12.5% increase. Site C: 120 ÷ 1,500 = 8.0% increase. Site B has the largest change at 12.5%. Site A attracts anyone comparing raw MWh, because it moved furthest in absolute terms (240 MWh), but it started from a base three times Site B's. Site C attracts the same mistake narrowed to the sites that grew: its 120 MWh rise is the largest increase in MWh, yet against a 1,500 MWh base it is only 8.0%. The same-percentage answer is what you get by dividing each change by the 2024 figure instead of the 2023 one: 240 ÷ 2,160 and 100 ÷ 900 both give 11.1%, an exact tie. That is the wrong base: the question asks for the change from 2023, so 2023 is the denominator.

Question 7

Correct answer: C) £4,100.00

Convert euros to pounds by dividing by the rate: 4,680 ÷ 1.17 = £4,000.00. Then add the 2.5% fee: 4,000 × 0.025 = £100.00, so the total is 4,000 + 100 = £4,100.00. Multiplying by 1.17 instead of dividing gives £5,475.60, and stopping at £4,000.00 forgets the fee entirely. Deducting the fee rather than adding it gives 4,000 × 0.975 = £3,900.00, but a bank charge increases what you pay, so it is added to the converted amount, not taken off it.

Question 8

Correct answer: B) £21,610

Find the margin per unit, then multiply by units sold. Widget A: (18.00 - 12.50) = £5.50 × 1,200 = £6,600. Widget B: (24.00 - 15.00) = £9.00 × 850 = £7,650. Widget C: (32.50 - 21.00) = £11.50 × 640 = £7,360. Total gross profit = 6,600 + 7,650 + 7,360 = £21,610. Total revenue alone is £62,800 and total cost alone is £41,190, and the difference between those two confirms £21,610. Adding the three unit margins on their own gives 5.50 + 9.00 + 11.50 = £26.00, which is the profit on one of each product rather than on everything sold; each margin still has to be multiplied by that product's units.

Question 9

Correct answer: B) 4.5 hours

Find the rate for a single machine first: 7,200 ÷ (3 machines × 4 hours) = 600 flyers per machine per hour. Five machines therefore produce 5 × 600 = 3,000 flyers per hour. The time needed is 13,500 ÷ 3,000 = 4.5 hours. The three wrong options each come from a specific slip. Reading 7,200 ÷ 4 = 1,800 flyers per hour as one machine's rate and then multiplying by five gives 9,000 per hour and 13,500 ÷ 9,000 = 1.5 hours, but 1,800 is the output of all three machines together. Dividing 7,200 by the three machines and forgetting the four hours gives 2,400 per machine and 13,500 ÷ 2,400 = 5.625 hours. Leaving the fleet at three machines gives 13,500 ÷ 1,800 = 7.5 hours.

Question 10

Correct answer: C) £35,000

The discounted price represents 100% - 12% = 88% of the original. So the original is 30,800 ÷ 0.88 = £35,000. Check it: 12% of 35,000 is £4,200, and 35,000 - 4,200 = £30,800. Adding 12% to the discounted figure instead gives 30,800 × 1.12 = £34,496, which is wrong because the 12% was taken off the larger original amount. Taking a further 12% off gives 30,800 × 0.88 = £27,104, which discounts a price that has already been discounted. Reversing the discount correctly and then adding the 12% back on top counts it twice: 35,000 × 1.12 = £39,200.

Question 11

Correct answer: D) Friday

Divide calls by agent hours for each day. Monday: 1,344 ÷ 96 = 14.0. Tuesday: 1,215 ÷ 90 = 13.5. Wednesday: 1,302 ÷ 93 = 14.0. Thursday: 1,160 ÷ 80 = 14.5. Friday: 1,020 ÷ 68 = 15.0. Friday is highest at 15.0 calls per agent hour, even though it had the fewest calls overall. Monday handled the most calls in total but only because far more agent hours were worked.

Question 12

Correct answer: A) £13,800

Each rate is quoted as foreign-currency units per £1, so convert by dividing. Supplier P: 5,400 ÷ 1.20 = £4,500. Supplier Q: 8,190 ÷ 1.30 = £6,300. Supplier R: 3,300 ÷ 1.10 = £3,000. Combined, 4,500 + 6,300 + 3,000 = £13,800. Adding the face values without converting at all gives 5,400 + 8,190 + 3,300 = £16,890, which treats three different currencies as if they were interchangeable. Adding those face values and then converting the lot at a single rate (Supplier P's 1.20) gives 16,890 ÷ 1.20 = £14,075; each invoice carries its own rate. Multiplying by the rate instead of dividing gives 6,480 + 10,647 + 3,630 = £20,757, which runs the conversion backwards: a pound buys more than one unit of each currency, so the sterling figure must be smaller than the face value, not larger.

Question 13

Correct answer: D) £1,201,200

Apply each change separately. New headcount: 24 × 1.25 = 30 people. New average salary: 38,500 × 1.04 = £40,040. Total bill = 30 × 40,040 = £1,201,200. Adding the percentages together and applying 29% to the current bill of 24 × 38,500 = £924,000 gives £1,191,960, which is wrong because the two increases compound rather than add. Applying only the headcount rise gives 30 × 38,500 = £1,155,000, and applying only the salary rise gives 24 × 40,040 = £960,960; both changes take effect in the same year, so both must be applied.

Question 14

Correct answer: B) 21.3%

Total mileage per vehicle type is the count multiplied by the mileage each. Small vans: 42 × 18,000 = 756,000. Large vans: 25 × 24,000 = 600,000. HGVs: 8 × 46,000 = 368,000. Fleet total = 756,000 + 600,000 + 368,000 = 1,724,000 miles. The HGV share is 368,000 ÷ 1,724,000 = 0.2135, or 21.3%. Counting vehicles rather than miles gives 8 ÷ 75 = 10.7%, which ignores how much further each HGV travels. Reading down to the wrong row and taking the large van total gives 600,000 ÷ 1,724,000 = 34.8%. Using the mileage-per-vehicle column as though those figures were the totals gives 46,000 ÷ 88,000 = 52.3%, which quietly treats the fleet as one of each vehicle rather than 42, 25 and 8.

Question 15

Correct answer: C) 34.56 km

Convert the shift to seconds: 8 hours × 60 × 60 = 28,800 seconds. Distance = 1.2 × 28,800 = 34,560 metres, which is 34.56 km. Reading the speed as 1.2 metres per minute gives 480 × 1.2 = 576 metres, or 0.576 km, and treating it as 1.2 km per hour gives 9.6 km. Getting 34,560 metres right but converting to kilometres by dividing by 100 instead of 1,000 gives 345.6 km. The unit on the rate has to match the unit on the time, and there are 1,000 metres in a kilometre.

Question 16

Correct answer: B) £110,205

Apply each tier's own churn rate, then re-price. Basic: 4,000 × 0.97 = 3,880 subscribers × £9.00 = £34,920. Standard: 2,500 × 0.98 = 2,450 × £18.00 = £44,100. Premium: 900 × 0.99 = 891 × £35.00 = £31,185. Total = 34,920 + 44,100 + 31,185 = £110,205. Current revenue, before any churn, is 36,000 + 45,000 + 31,500 = £112,500, so anyone answering that has stopped a step early. Applying the worst tier's 3% rate across the whole business gives 112,500 × 0.97 = £109,125, which over-churns the two tiers that are more loyal. Applying the churn as growth rather than loss (4,120 × £9.00, 2,550 × £18.00 and 909 × £35.00) gives £114,795; churn is subscribers leaving. Note that no single blended rate reproduces the right answer: the tiers must be churned separately because the cheapest tier loses subscribers fastest, so a smaller share of the loss falls on the dearest seats.

Question 17

Correct answer: D) 4.4% increase

Average selling price is revenue divided by units. February: 47,600 ÷ 1,400 = £34.00. March: 46,860 ÷ 1,320 = £35.50. The change is 35.50 - 34.00 = £1.50, so 1.50 ÷ 34.00 = 0.0441, a 4.4% increase. Looking at revenue rather than price shows a 1.6% decrease, and using March as the base gives 1.50 ÷ 35.50 = 4.2%. Comparing March with January instead of February gives an average price of 43,750 ÷ 1,250 = £35.00 in January and so 0.50 ÷ 35.00 = 1.4%, which measures from the wrong month.

Question 18

Correct answer: B) £101,200

Split the cost first: 7 + 5 = 12 parts, so one part is 96,000 ÷ 12 = £8,000. The larger depot pays 7 × 8,000 = £56,000 and the smaller pays 5 × 8,000 = £40,000. Apply the changes: 56,000 × 1.15 = £64,400 and 40,000 × 0.92 = £36,800. Combined, 64,400 + 36,800 = £101,200. Netting the percentages to +7% and applying that to the whole £96,000 gives £102,720, which wrongly assumes an equal split. Averaging the two percentages to +3.5% and applying that gives 96,000 × 1.035 = £99,360, and applying the larger depot's 15% rise to the whole cost gives 96,000 × 1.15 = £110,400, which puts the smaller depot's £40,000 share up as well instead of down.

Question 19

Correct answer: B) £28.80 per m²

Cost equals energy use × tariff, converted from pence to pounds, then divided by floor area. Site A: 288,000 × £0.240 = £69,120 ÷ 2,400 = £28.80 per m². Site B: 252,000 × £0.225 = £56,700 ÷ 1,800 = £31.50 per m². Site C: 320,000 × £0.300 = £96,000 ÷ 3,200 = £30.00 per m². Site A is lowest at £28.80. Site C uses the least energy per square metre and Site B has the smallest total bill, but neither is the cheapest once tariff and floor area are combined: Site C's figure is £30.00 and Site B's is £31.50. Averaging the three tariffs to 25.5p and applying that single rate to every site gives £30.60, £35.70 and £25.50, making Site C look cheapest at £25.50, but each site buys electricity at its own tariff, and Site C's is the dearest of the three.

Question 20

Correct answer: B) £271,890

Apply each change to the running balance, not to the original sum. Year one: 250,000 × 1.06 = £265,000. Year two: 265,000 × 0.95 = £251,750. Year three: 251,750 × 1.08 = £271,890. Adding the percentages to a net +9% and applying that to £250,000 gives £272,500, which is wrong because each year compounds on the previous balance. Ignoring the year-two fall gives 250,000 × 1.06 × 1.08 = £286,200, and £251,750 is the balance at the end of year two, so choosing it means stopping a year early.

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