

EVERYDAY MATHS PROBLEMS

Maths on the road

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Use the information about these two driving schools to answer the questions on page 5.

Pass 1st School of Motoring

£22 per hour Lessons are two hours long. Book 12 two-hour lessons and save £2 per hour – that's £4 off each lesson. Or use our block booking prices:

24 hours on road	£480
30 hours on road	£570
40 hours on road	£720



At A-Class School of Motoring, we are pleased to offer a range of driving courses to suit all needs and levels of ability.

- All courses are available to all ages and levels of ability, subject to legal requirements
- Guaranteed one-hour lessons
- Reliable, punctual service
- Seven days a week

Description	Costs
Basic	
One-hour lesson	£20
10 lessons	£190
20 lessons	£370
Intensive courses	
<ul style="list-style-type: none"> ▪ Get up to speed for your test ▪ Some driving experience required ▪ All theory tests must be passed before application 	
10 hour intensive course	£272
20 hour intensive course	£452
30 hour intensive course	£637
	(includes driving test fee)
Guaranteed pass	
<ul style="list-style-type: none"> ▪ No experience necessary ▪ We will get you your licence, no matter what! (includes driving test fee) ▪ Price covers driving test fee (excluding theory test fee) 	

1. Which school of motoring has the cheapest hourly rate for single lessons?

2. How much per hour would 24 hours of lessons with Pass 1st cost?

3. How much per hour would 10 basic lessons with A-Class cost?

4. James had 40 basic lessons with A-Class before he passed his test. If he booked the lessons in blocks of 10, how much did he spend?

5. Anoushka had 36 2-hour lessons with Pass 1st before she passed her test. If she booked the lessons in blocks of 12, how much did she spend?

6. How much per hour do each of A-Class' intensive courses cost, rounded to the nearest penny? (Assume the driving test fee is £58.)

7. If you knew in advance that it was going to take you 39 hours of driving lessons to pass your test, which of A-Class' lessons would be the best value for money?

8. If you knew in advance that it was going to take you 50 hours of driving lessons to pass your test, which of A-Class' lessons would be the best value for money?

9. If you knew in advance that it was going to take you 36 hours of driving lessons to pass your test, which combination of Pass 1st's lessons would be the best value for money?

10. If you knew in advance that it was going to take you 50 hours of driving lessons to pass your test, which combination of Pass 1st's lessons would be the best value for money?

Use this information from adverts for second-hand cars to answer the questions on page 7.

FORD FOCUS 2.0 ZETEC

52 reg, five months' tax and MOT, good condition, silver, alloys, sunroof, air-con, immobiliser and sports seats. £1,295 ono

HONDA AUTO CIVIC, 1.4iSE, 2002, 02 reg, three door, low mileage, fsh, MoT, tax, excellent condition. Reluctant sale, £2,975

MERCEDES C200 CDI

Manual, 2005, 55 reg, sunroof, power steering, 10 CD changer, air conditioning, 12 months' MoT, fsh. Excellent condition. £3,975

PEUGEOT 206, 1.4 VERVE 2006, 06 reg, five door, tax, MoT, 65k, CD, immaculate, ideal first car. £2,400 ono

RENAULT CLIO 1.9D, W reg, 10 months' MoT, four months' tax, stereo, recon engine, £300 ono

RENAULT MEGANE 1.6 VVT, very good condition, tax and long MoT, lady owner. £1,100 ono

TOYOTA YARIS, 2005, 1.0, electric windows/mirrors, side airbags, CD/radio with four speakers, 12 months' MoT, 6 months' tax. £3,000

VAUXHALL ASTRA 1.9 CDTi

2-dr, black, 2008 (08), FSH, air-con., CD, alloys, five months' tax. Excellent condition. £6,300 ono

VAUXHALL CORSA 1.2i 16V CD, 52 reg, full electric, 6 months' MoT, 4 months' tax, stereo. £950

VOLVO V40, Y reg, alloys, four new tyres, serviced, 12 months' MOT, excellent condition throughout. £350

1. How many cars cost more than £2000? _____

2. How many cars say they have a stereo or CD player? _____

3. What percentage of the cars have a sunroof? _____

4. What fraction of the cars have air conditioning? _____

5. What percentage of the cars have tax? _____

6. What is the difference in price between the cheapest and the most expensive car? _____

7. What is the average price of these second-hand cars? _____

8. Which car for less than £1000 has the longest MOT? _____

9. Rank the cars in price order, cheapest first.

10. Rank the cars in age order, oldest first. Which car can't you rank? You may need to ask your teacher for help with car registration letters and ages. All of the letters in the adverts are prefixes. _____

Use this information about new cars and loans to answer the questions on page 9.

Car finance offers

Vauxhall Astra 1.6i 16V Sxi 5d		Ford Mondeo Diesel Hatchback 1.6 TDCi ECO 115ps	
Vauxhall deposit contribution	£3,000	Ford deposit contribution	£1,500
On the road price	£19,440	On the road price	£20,195
Deposit	£1000	Deposit	£6,274.45
Amount to credit (secured on car)	£15,440	Amount to credit	£12,420.55
1st monthly payment followed by 46 payments of	£685.00 £342.50	24 monthly payments of	£279.00
		Total amount payable	£23,688.45

New car prices

Audi A6	£30,810	Fiat Punto	£9,800
BMW 3 series saloon	£23,180	Honda Jazz	£11,605
Citroen C3	£10,890	Nissan Qashqai	£16,595

Mega loans

Loan amount	36 months	Total amount repayable	48 months	Total amount repayable	60 months	Total amount repayable
£5,000	£154.80	£5,572.80	£120.08	£5,763.84	£99.25	£5,955.00
For each additional £1000	£32.26	£1161.20	£31.16	£1123.00	£21.15	£1269.00

1. Which is the most expensive new car listed?

2. How much interest would you pay back if you bought a Ford Mondeo through Car Finance?

3. What are the usual monthly payments for a Vauxhall Astra through Car Finance?

4. How much would the monthly repayments be on a Mega Loan for a BMW 3 series saloon on a three-year term? Round the loans to the nearest 1000.

5. How much interest would you repay on a Mega Loan of £9000 over four years?

6. How much interest would you repay on a Mega Loan of £12,000 over five years?

7. How much deposit would you need to give Car Finance to pay for the Ford Mondeo?

8. How much interest is paid on a Mega Loan of £12,000 repaid over three years, four years and five years?

9. How much would the total repayments be for the each of the new cars listed over three years with a Mega Loan? (Round the car prices to the nearest £1000.)

10. If you want a Vauxhall Astra, which loan is cheaper over 48 months- Car Finance or Mega Loans? (Work out a loan of £19,000 to compare.)

If you own a car you have to have insurance. Use this information about car insurance to answer the questions on page 11.

The cost of car insurance varies across the country. This table shows the average cheapest and most expensive premiums paid by area/postcode across the UK.

Rank	Area/postcode	Cheapest average premium
1	Perth PH	£285.95
2	Inverness IV	£287.97
3	Dumfries DG	£294.16
4	Kirkcaldy KY	£303.70
5	Galashiels TD	£307.47
6	Falkirk and Stirling FK	£309.49
7	Dundee DD	£310.98
8	Exeter EX	£314.11
9	Kilmarnock KA	£314.60
10	Torquay TQ	£321.34
Rank	Area/postcode	Most expensive average premium
1	London E	£938.10
2	London WC	£834.65
3	London NW	£805.90
4	Ilford IG	£790.76
5	Southall UB	£784.88
6	London N	£780.47
7	Manchester M	£752.64
8	Liverpool L	£746.28
9	Oldham OL	£742.14
10	London SE	£719.36

Car insurance 2

1. Which postal area has the cheapest average premium?

2. Outside London, which postal area has the most expensive average premium?

3. How much cheaper is the average premium in Torquay compared to London WC?

4. How much cheaper is the average premium in London SE compared to London NW?

5. What is the average premium for London?

6. Work out the average premium for the 10 cheapest premiums in the UK.

7. In the space below draw a bar chart to compare the average premiums in the London postal areas.

Penalty points and premiums

Getting a speeding ticket can drastically alter the cost of your insurance. Use this information to complete the table and answer the questions below.

The information in this table is for a 42-year-old male with full no claims, driving a £12,000 car for a maximum of 12,000 miles.

Insurer	Clean licence	2 speeding fines percentage increase	Actual cost increase
Halifax	£411.29	30%	
Swinton	£305.80	33%	
Santander	£335.09	17%	
esure	£239.86	25%	
Sheila's Wheels	£239.89	20%	
More Than	£381.84	13%	

- Which insurance company has the cheapest premium for a clean licence? _____
- Which insurance company has the most expensive premium for a clean licence? _____
- What is the difference in price between insurance from Swinton and More Than for a clean licence? _____
- Which insurance company has the highest percentage increase for two speeding fines? _____
- What is the difference in price between insurance from Halifax and Sheila's Wheels for a licence with points? _____

Use the information in the table about discounts to answer the questions below.

Insurance discounts

	Discounts	To qualify
First policy	15–65%	Must be a newly acquired car or first time insurance
Multi-car	10%	Insure up to 5 cars on one policy
Age discount	10–20%	Being over 25/30/50/60
2nd car	30–65%	Must have access to another car
Low mileage	Special 'low mileage rates' available	Driving 3000, 6000, 8000, 9000 miles per year
Classic cars	Special schemes	Vehicle to be garaged and to cover less than 3000 miles per year
Older cars	5–25%	Vehicles more than five years old

1. It would have cost Louise £650 a year to insure her car, but she was offered age discount at 10% – what did she pay per year?

2. It would have cost Ainsley £1500 a year to insure his car, but he was offered first policy discount at 40% – what did he pay per year?

3. It would have cost Olive £350 a year to insure her car, but she was offered low mileage discount at 15% – what did she pay per year?

4. It would have cost Eric £850 a year to insure his car, but he was offered older car discount at 15% – what did he pay per year?

5. It would have cost Jan £945 a year to insure two cars, but she was offered multi-car discount at 10% – what did she pay per year?

Use this information to answer the questions about getting on the road on page 15.

Driving lessons

Provisional licence	£50.00
L plates	£2.49
Highway Code book	£2.49
16 two-hour lessons at	£40.00 each
Written part of driving test	£31.00
Insurance on parents' car before passing his test	£800.00

Driving test fees

Practical part of driving test weekday	£62.00
Practical part of driving test weekend	£75.00

Insurance on parents' car after passing his test	£400
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Car costs

New Ford Ka	£8,725
Insurance on Ford Ka	£1,000

New Mini Cooper	£12,000
Insurance on Mini Cooper	£1,400

New Renault Clio	£10,595
Insurance on Renault Clio	£1,150

Second-hand Renault Clio	£2,500
Insurance on Renault Clio	£852

Second-hand Nissan Micra	£3,000
Insurance on Nissan Micra	£600

Second-hand Volkswagen Golf	£4,000
Insurance on Volkswagen Golf	£3,000

1. Tom took his test at the weekend.
Altogether, how much did it cost Tom to get his driving licence? _____

2. By what fraction did the insurance on Tom's parents' car alter after Tom passed his test? _____

3. Which of the second-hand cars is the cheapest? _____

4. Which of the new cars is the most expensive? _____

5. Which car is the most expensive to insure? _____

6. Which car is the cheapest to insure? _____

7. What do you think the trend is for the cost of insurance? _____

8. What reason do you think there could be for a Golf costing as much to buy as it does to insure? _____

9. Express the cost of insuring the Micra as a fraction of buying it. _____

10. What percentage of the total cost of owning the Mini Cooper does the insurance represent (to the nearest whole number)? _____

The cost of car tax now depends on when the car was registered and how environmentally friendly it is. Use the information about car tax costs to answer the questions on page 17.

Private vehicles (cars, taxis and light vans) registered before 1 March 2001, based on engine size.

Private/light goods	12 months rate £	6 months rate £
Not over 1549cc	140.00	77.00
Over 1549cc	225.00	123.75

Private vehicles (cars and taxis) registered on or after 1 March 2001, based on CO² emissions and fuel type.

Band	CO ² emission figures (g/km)*	Diesel car 12 months rate £	Diesel car 6 months rate £	Petrol car 12 months rate £	Petrol car 6 months rate £	Alternative fuel 12 months rate £	Alternative fuel 6 months rate £
A	up to 100	0.00	—	0.00	—	0.00	—
B	101–110	20.00	—	20.00	—	10.00	—
C	111–120	30.00	—	30.00	—	20.00	—
D	121–130	105.00	57.75	105.00	57.75	95.00	52.25
E	131–140	125.00	68.75	125.00	68.75	115.00	63.25
F	141–150	140.00	77.00	140.00	77.00	130.00	71.50

Vehicles registered on or after 1 April 2010

Band	CO ² emission figures (g/km)*	Diesel car 12 months rate £	Diesel car 6 months rate £	Petrol car 12 months rate £	Petrol car 6 months rate £	Alternative fuel 12 months rate £	Alternative fuel 6 months rate £
G	151–165	175.00	96.25	175.00	96.25	165.00	90.75

1. Dev owns a diesel car registered in 2002 that has CO² emissions of 150 g/km. How much will his car tax cost at the 12 months' rate?

2. Sheila owns a petrol Ford Fiesta registered in 2008 that has CO² emissions of 139 g/km. How much will her car tax cost for a year at the 6 months' rate?

3. Shobna pays £30 per year for car tax at the yearly rate. What are the CO² emissions of her car and is it petrol/diesel or alternative fuel?

4. Eric pays £115 per year for car tax at the yearly rate. What are the CO² emissions of his car and is it petrol/diesel or alternative fuel?

5. For a car registered before 1 March 2001, how much is road tax if you have a car not over 1549cc and pay at the 12 months' rate?

6. You have a petrol car with CO² emissions of 125 g/km. How much would you save if you paid car tax for a year at the 12 months' rate rather than at the 6 months' rate?

7. You have a diesel car with CO² emissions of 135 g/km. How much would you save if you paid car tax for a year at the 12 months' rate than at the 6 months' rate?

8. Per day, and to the nearest penny, how much is car tax for a car registered before 1 March 2001 with an engine over 1549cc paid at the 12 months' rate (in a non-leap year)?

9. Per day, and to the nearest penny, how much is car tax for a petrol car registered after 1 March 2001 with CO² emissions of 130 g/km at the yearly rate (in a non-leap year)?

10. What is the range of car tax payable in the UK at the yearly rate?

Use this information about MOT costs to answer the questions on page 19.

Note: Fees not subject to VAT Fees shown are maximum fees	Age first test certificate required (years)	Cost
Motorbikes – classes 1 & 2 Class 1 engine size up to 200cm ³		
Motorbicycles	3	£29.65
Motorbicycles with sidecar	3	£37.80
Motorbikes – class III		
3-wheeled vehicles (up to 450kg unladen weight)	3	£37.80
Class IV		
Cars (up to 8 passenger seats)	3	
Motor caravans	3	
3-wheeled vehicles (over 450kg unladen weight)	3	
Quads (max. unladen weight 400kg – 550kg for goods vehicles and max. net power of 15KW)	3	
Dual purpose vehicles	3	
PSVs (up to 8 seats)	3	
Goods vehicles (up to 3,000kg DGW)	3	
Ambulances and taxis Taxis and Private Hire Vehicles may be subject to additional local requirements	1	£54.85
Private passenger vehicles & ambulances (9–12 Passenger seats)	1	£57.30
Maximum fee for duplicate test certificate		£10.00 or half full fee

1. Which type of vehicles have to be tested when they are one year old?

2. What is the maximum test fee for a vehicle?

3. What is the price difference between the maximum test fee for a class III motorbike and a class II motorbike?

4. Use the space below to draw a bar chart to show the costs of MOTs for class I, II, III and IV. Don't forget to give your chart a title and use a key if necessary.

Use this information about fuel costs to answer the questions on page 21.

Fuel is one running cost that rarely seems to get any cheaper. In the UK fuel is subject to government tax which means that the Chancellor has the option to alter the tax on it twice a year. In April 2013 fuel duty was frozen at 58p/litre. VAT is charged on top so the percentage that's paid in tax varies with pump price. At £1.32/litre, 58p is duty, 59p pays for product, delivery and retailer margin and the remaining 15p is VAT. The total paid in tax (duty and VAT) is 73p or 55% of the pump price.

Fuel at garages is sold by the litre. Per litre prices vary from garage to garage and region to region across the UK. Shopping around will help you save money on petrol. This table shows the regional variations in prices for unleaded petrol in March 2013.

Area of petrol station	Cheap petrol price	Average petrol price	Expensive price
East Anglia	133.7	134.9	136.9
Scotland (lowlands)	140.9	137.0	140.9
South West	133.9	137.2	145.9
South East	131.9	136.7	143.9
Midlands	132.9	136.9	147.9
Scotland (Highlands)	134.9	136.7	138.9
North East	131.9	136.7	142.9
Northern Ireland	137.9	138.9	140.9
North West	133.9	137.5	148.9
Wales	132.9	136.7	144.0
South Coast	135.7	138.0	140.9
Scottish Isles	143.9	145.2	147.9

1. What is the range of prices of unleaded petrol across the UK?

2. Which region has the cheapest average prices?

3. Which region has the greatest variation in petrol prices?

4. For the whole of the UK, what is the average saving a motorist could make if he or she buys petrol from a cheap source compared to an expensive source?

5. What is the average cost of petrol in the Scottish Highlands to the nearest penny?

6. How much would it cost to buy 45 litres of petrol at an average price in the Midlands?

7. How much would it cost to buy 30 litres of petrol at an expensive price in the East Anglia?

8. What would be the price difference between buying 60 litres of petrol at an average cost in the South West compared to buying it in Northern Ireland?

9. What is the total amount of tax per litre (duty and VAT) on petrol from a cheap source in Northern Ireland?

10. What is the total amount of tax per litre (duty and VAT) on petrol from an expensive source in the Scottish Isles?

Use this information about average running costs for a diesel car in 2013 to answer the questions on page 23.

Diesel car running costs basic guide for 2013

	Cost new (£s)				
	up to £16,000	£16,000 to £22,000	£22,00 to £26,000	£26,00 to £36,000	over £36000
<i>Standing charges per annum (£s)</i>					
Road tax	30.0	140.0	175.0	220.0	475.0
Insurance	700.0	840.0	1100.0	1495.0	1930.0
Cost of capital	253.0	374.0	453.0	582.0	959.0
Depreciation (at 10,000 miles/annum)	1487.0	2301.0	2824.0	3713.0	7438.0
Breakdown cover	50.0	50.0	50.0	50.0	50.0
Total (£s)	2520.00	3705.00	4602.00	6060.00	10852.00
<i>Standing charges per mile (pence)</i>					
5,000	49.81	73.18	90.91	119.71	214.06
10,000	25.20	37.05	46.02	60.60	108.52
15,000	17.20	25.31	31.43	41.39	74.33
20,000	13.34	19.68	24.42	32.16	58.98
25,000	10.79	15.92	19.76	26.02	46.98
30,000	9.04	13.35	16.56	21.81	39.40
<i>Running costs per mile (pence)</i>					
Diesel*	10.03	12.19	13.59	15.44	19.97
Tyres	1.20	1.80	1.95	3.30	3.90
Service labour costs	4.35	4.45	4.77	4.81	7.46
Replacement parts	2.91	2.81	2.88	3.43	3.72
Parking and tolls	2.00	2.00	2.00	2.00	2.00
Total (pence)	20.49	23.25	25.19	28.98	37.05
* Fuel @ 142.6p/litre. For every penny more or less, add or subtract	0.07	0.08	0.10	0.11	0.14

1. What was the average cost of insurance for a car worth £18,000?

2. What was the average cost of depreciation for a car worth £32,000?

3. If a car is worth £15,000 new and you do 25,000 miles a year in it, how much are the standing charges per mile?

4. If you do 10,000 miles a year in a car worth £10,000 new, how much are the total annual running costs?

5. If you do 10,000 miles a year in a car worth £10,000 new, how much are the total annual standing charges?

6. If you do 15,000 miles a year in a car worth £19,000 new, how much are the annual running costs only?

7. If your car is worth £19,000 new, how much are the total annual standing charges only?

8. You drive 17,000 miles a year. What are the annual service labour costs on a car worth £12,000 new?

9. You drive 4,000 miles a year. What are the total annual running costs for fuel on a car worth £23,000 new?

10. You drive 10,000 miles a year. What is the total annual cost of owning a car worth £9,000 new?

Use this information about fuel consumption to answer the questions on page 25.

Manufacturer & model	Transmission	Fuel Type	CO ² Emissions (g/km)	Imperial combined fuel consumption (mpg)
Ford Fiesta 1.4 Duratec	M5	Petrol	147	45.6
Honda Jazz 1.2 i-DSI S	5MT	Petrol	129	51.4
Isuzu Trooper 3.5 V6 4WD (Insignia model only)	A4	Petrol	355	18.8
Landrover Freelander 2.5 V6	A5	Petrol	298	22.7
Mazda RX8 231 PS	M6	Petrol	284	25.2
Mercedes CLK 200 Kompressor (16" wheels)	M6	Petrol	198	34.0
Nissan Micra 1.5 dCi 65	M5	Diesel	128	58.9
Passat Estate 2.0 TDI (140 PS) DSG	D6	Diesel	181	42.2
Peugeot 107, 1.0 (65 bhp)	M5	Petrol	109	61.3
Range Rover Sport 4.2 V8 super charged	A6	Petrol	374	17.8
Renault Espace 2.2 dCi Auto (JK0HBB) (w/sunroof)	A5	Diesel	244	31.0
Vauxhall Meriva 1.6i 16v 5-door MPV	M5	Petrol	175	38.6

Fuel consumption 2

1. Which car uses the most fuel per mile? _____
2. Which car uses the least fuel per mile? _____
3. If you drove 30 miles in the Passat Estate, how many gallons of diesel would you use? _____
4. If you drove 190 miles in the Mercedes, how many gallons of petrol would you use? _____
5. How many more miles per gallon do you get from the Nissan Micra compared to the Landrover Freelander? _____
6. How many fewer miles per gallon do you get from the Isuzu Trooper compared to the Vauxhall Meriva? _____
7. If you start with 30 gallons of petrol, how far will you get in a Mazda RX8? _____
8. If you start with 20 gallons of petrol, how far will you get in a Vauxhall Meriva? _____
9. You drive 300 miles in a Renault Espace, how much fuel will you use? _____
10. Do you think there is any correlation between fuel consumption and CO² emissions? If so what is it? _____

Use this information about miles and kilometres to answer the questions below.

Signs in the UK give distance in miles per hour. On the European mainland distances are given in kilometres. On the speed dial of a car, speed is given in both kilometres and miles per hour.

To convert kilometres into miles you multiply the number of kilometres by 1.609. So 30 miles an hour is:

- $30 \times 1.609 = 48.47$ kilometres an hour

To convert miles into kilometres you multiply the number of miles by 0.6214. So 60 kilometres an hour is:

- $60 \times 0.6214 = 37.284$ miles an hour

1. How many kilometres is 40 miles? _____

2. How many miles is 65 kilometres? _____

3. How many kilometres is 25 miles? _____

4. How many miles is 50 kilometres? _____

5. How many kilometres is 80 miles? _____

6. How many miles is 400 kilometres? _____

7. How many kilometres is 380 miles? _____

8. How many miles is 90 kilometres? _____

Miles per hour 2

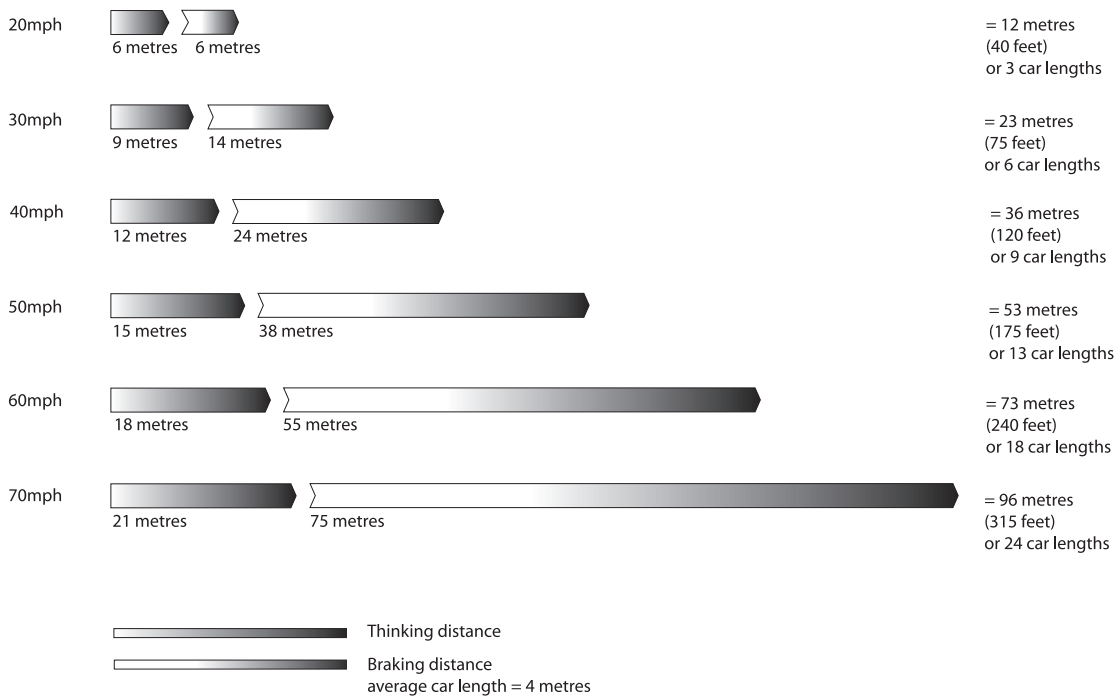
Use the information about miles and kilometres on page 26 to complete the table below. Round your answers in the table to the nearest whole mile or kilometre.

Miles per hour	Kilometres per hour
20	
30	
	50
	60
40	
	70
50	
	80
	90
60	
	100
	110
70	
	120
	130

Use this information about shortest stopping distances to answer the questions on page 29.

These distances are based on good weather conditions, an observant driver and for a car with good tyres.

Typical stopping distances



1. What is the thinking distance when you are driving at 50 miles per hour?

2. What is the braking distance when you are travelling at 70 miles per hour?

3. What is the stopping distance when you are travelling at 40 miles per hour?

4. At what speed is a car travelling if the braking distance is 55 metres?

5. At what speed is a car travelling if the thinking distance is 12 metres?

6. At what speed is a car travelling if the stopping distance is 96 metres?

7. How many average car lengths are equivalent to 96 metres?

8. How many average car lengths are equivalent to 12 metres?

9. How many car lengths is the braking distance when you are travelling at 40 miles per hour?

10. How many car lengths is the braking distance when you are travelling at 50 miles per hour?

Use this information about speed limits from the Highway Code to answer the questions on page 31.

103: You MUST NOT exceed the maximum speed limits for the road and for your vehicle (see the table below). Street lights usually mean that there is a 30mph speed limit unless there are signs showing another limit.

Speed limits

Type of vehicle	Built-up areas*	Elsewhere		Motorways
	MPH	Single carriage-ways MPH	Dual carriage-ways MPH	MPH
Cars and motorcycles (including car derived vans up to 2 tonnes maximum laden weight)	30	60	70	70
Cars towing caravans or trailers (including car derived vans and motorcycles)	30	50	60	60
Buses and coaches (not exceeding 12 metres in overall length)	30	50	60	70
Goods vehicles (not exceeding 7.5 tonnes maximum laden weight)	30	50	60	70+
Goods vehicles (exceeding 7.5 tonnes maximum laden weight)	30	40	50	60

These are the national speed limits and apply to all roads unless signs show otherwise.

* The 30mph limit applies to all traffic on all roads in England and Wales (only Class C and unclassified roads in Scotland) with street lighting unless signs show otherwise.

+ 60 if articulated or towing a trailer

104: The speed limit is the absolute maximum and does not mean it is safe to drive at that speed irrespective of conditions. Driving at speeds too fast for the road and traffic conditions can be dangerous. You should always reduce your speed when:

- the road layout or condition presents hazards, such as bends
- sharing the road with pedestrians and cyclists, particularly children, and motorcyclists
- weather conditions make it safer to do so
- driving at night as it is harder to see other road users.

1. What speed limit do street lights usually mean?

2. What is the speed limit for a car on a motorway?

3. What is the maximum speed for a coach on a dual carriageway?

4. What is the difference in speed limits of a car towing a trailer or caravan and a car on a motorway?

5. What is the difference in speed limits for a car and a heavy goods vehicle on a single carriageway?

6. What is the speed limit for articulated goods vehicles on motorways?

7. What is the speed limit for a goods vehicle weighing 7 tonnes on a dual carriageway?

8. What is the range of speed limits for a car?

9. A heavy goods vehicle is driving at 50mph on a single carriageway. By how much is it exceeding the speed limit?

10. A car is driving at 85mph on a dual carriageway. By how much is it exceeding the speed limit?

Use this information about fines and points to answer the questions on page 33.

Offence	Penalty points	Likely penalty	Disqualification	Fixed penalty option
Accidents				
Failing to stop after an accident	5-10	Fine up to £5000	Possible	No
Failing to report an accident	5-10	Fine up to £5000	Possible	No
Alcohol or drugs				
Refusing roadside breath test	4	Fine up to £1,000	Possible	No
In charge with excess alcohol/drugs	10	Fine up to £2,500	Likely	No
After being in charge refusing to supply specimens for analysis	10	Fine up to £2,500	Likely	No
Driving with excess alcohol/drugs	(3-11)	Fine up to £5,000	Compulsory	No
After driving refusing to supply specimens for analysis	(4)	Fine up to £5,000	Compulsory	No
Documents				
No insurance	6-8	Fine up to £5,000	Possible	No
No tax	0	Fine up to £1,000	Not an option	Yes
No MOT	0	Fine up to £1,000	Not an option	Yes
No driving licence	3-6	Fine up to £1,000	Possible	No
Speeding				
Speeding – Exceeding the speed limit (non-motorway)	3-6	Fine up to £1,000	Probable if more than 30mph over limit	Yes
Speeding – Exceeding the speed limit on the motorway	3-6	Fine up to £2,500	Probable if driving at over 100mph	Yes

1. Which offences attract the highest fines? _____

2. How many penalty points could you get on your licence if you are convicted of being in charge of a vehicle with excess alcohol/drugs? _____
3. How many penalty points would you get on your licence if you are convicted of refusing a roadside breath test? _____
4. If you are convicted of driving at over 100mph on a motorway, what is likely to happen to you? _____

5. How many penalty points would you get on your licence if you are convicted of having no MOT? _____
6. If you are convicted of having no driving licence and speeding, what is the maximum number of points you could get on your licence? _____
7. If you are convicted of having no driving licence and speeding, what is the minimum number of points you could get on your licence? _____
8. If you are convicted of having no insurance and no tax, what is the maximum fine you could get? _____
9. What is the average fine, assuming the maximum given? _____
10. What percentage of these offences would definitely result in a driving ban? _____

Journey times 2

1. The journey between Oban and Fort William takes 1 hour and 20 minutes and Sally needs to be in Fort William by 10am. What time should she leave Oban?

2. The journey between Stirling and Aviemore takes 2 hours and 10 minutes and Raj needs to be in Aviemore by 3.30pm. What time should he leave Stirling?

3. The journey between Berwick upon Tweed and Inverness takes four hours and Stella needs to be in Inverness by 8.00pm. What time should she leave Berwick upon Tweed?

4. The journey between Carlisle and Edinburgh takes two and a half hours and Osman needs to be in Edinburgh by 5.00pm. What time should he leave Carlisle?

5. It takes Phil four hours to drive from Glasgow to Oban. What is his average speed?

6. It takes Elizabeth four hours to drive from Thurso to Ullapool. What is her average speed?

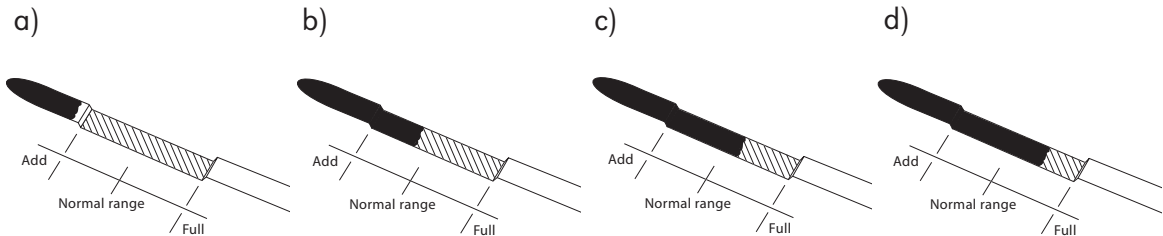
7. It takes Patrick half an hour to drive from Pitlochry to Perth. What is his average speed?

8. It takes Orla half an hour to drive from St Andrews to Perth. What is her average speed?

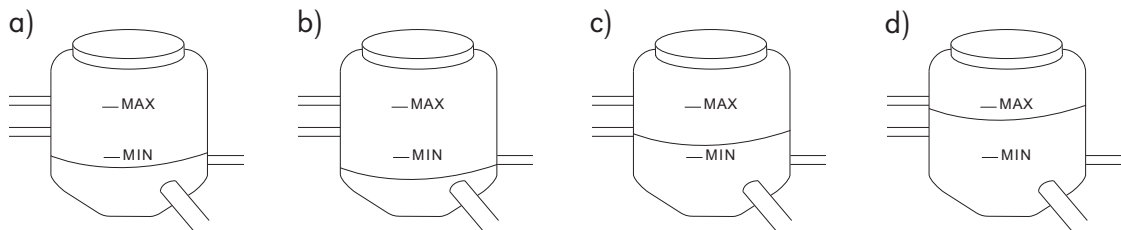
To run efficiently a car needs regular supplies of liquids that need to be checked. Use the information below to answer the questions on page 37.

Liquid	Instructions	Reservoir volume small car	Reservoir volume medium car	Reservoir volume large car
Brake fluid	<ul style="list-style-type: none"> ▪ Use only NEW brake fluid. ▪ Check the fluid in the reservoir. If the fluid is below the 'MIN' level or the brake warning light comes on, add brake fluid up to the 'MAX' line. ▪ Only use fluid recommended for your vehicle. 	0.71 litres	0.9 litres	1.2 litres
Coolant level	<p>Check the coolant level in the reservoir tank when the engine is cold. If the coolant level is below the 'MIN', add coolant up to the 'MAX' level.</p> <p>NOTE: Some older vehicles do not have a coolant reservoir tank. If so, just remove the radiator cap and check the coolant is up to the filler opening.</p>	6.2 litres	8 litres	9 litres
Engine oil	<ul style="list-style-type: none"> ▪ Remove the dipstick and wipe it clean with a dry cloth. Re-insert it fully. ▪ Remove the dipstick again and check the oil level. It should be between the 'H' and 'L' marks. If the oil is below the 'L' mark, remove the oil filler cap and fill. ▪ Recheck oil level with dipstick. 	3.1 litres	4 litres	7.5 litres
Washer fluid	<ul style="list-style-type: none"> ▪ Fill the bottle to the neck using windscreen washer fluid or water. ▪ During winter months water is likely to freeze so make sure 50% windscreen washer fluid is added. DO NOT USE ANTI-FREEZE. 	3 litres	3.5 litres	4 litres

1. Which of the following dipstick readings needs more oil?



2. Which of the following brake fluid tanks need more fluid?



3. If you use washer fluid at a ratio of 1:4 parts water, how much fluid will you need to fill the washer reservoir of a small car?

4. You fill up a brake fluid reservoir on a medium car. You start with a 1 litre bottle of fluid, and have 775ml left. How much did you use?

5. What is the difference in capacity of coolants in a small car and a large car?

Use this information about the writing on tyre sidewalls to answer the questions on page 39.

At first glance the lettering on the side of the tyre may look complicated. It is not meant to be that way. The lettering explains the exact specification of the tyre.

Sidewall marking	Explanation
205	Width of the tyre in millimetres
50	Height of the tyre sidewall as a percentage of the width – in this case 50% of 205mm (also known as the aspect ratio).
R	Radial construction
15	The diameter of the tyre's inner rim in inches
91	Load capacity of tyre (see Load Table). In this case it's 615kg.
V	Speed symbol – indicates the maximum speed for the tyre at full load. In this case it's 149.1mph.
E4	ECE type approval mark, which demonstrates the tyre has been tested as high quality by the European Regulatory Authorities.

Tyre speed ratings

Speed rating	Miles/ Hour	Kilometers/ Hour	Speed rating	Miles/ Hour	Kilometers/ Hour
N	87	140	R	106	170
P	93	150	S	112	180
Q	99	160	T	118	190
Speed rating	Miles/ Hour	Kilometers/ Hour	Speed rating	Miles/ Hour	Kilometers/ Hour
U	124	200	Z	150+	240+
H	130	210	W	168	270
V	149	240	Y	186	300

Load index	Load in kg	Load index	Load in kg	Load index	Load in kg
62	265	79	437	96	710
63	272	80	450	97	730
64	280	81	462	98	750
65	290	82	475	99	775
66	300	83	487	100	800
67	307	84	500	101	825
68	315	85	515	102	850
69	325	86	530	103	875
70	335	87	545	104	900
71	345	88	560	105	925
72	355	89	580	106	950
73	365	90	600	107	975
74	375	91	615	108	1000
75	387	92	630		
76	400	93	650		
77	412	94	670		
78	425	95	690		

Tyre deciphering 2

1. What is the width of a tyre with this tyre wall marking: 205/55 R15 86 V? _____
2. What is the load capacity of a tyre with this tyre wall marking: 195/55 S16 79 V? _____
3. What is the maximum speed for this tyre at full load: 205/55T 16 90 W? _____
4. How much faster is the maximum speed of a W-rated tyre than an S-rated one? _____
5. What is the aspect ratio of a tyre with this tyre wall marking: 205/55 R16 80 H? _____
6. Which of the tyres listed below is the widest? _____
7. Which of the tyres listed below has the highest maximum speed rating? _____
8. What percentage of the tyres listed below have a load capacity of 530kg or more? _____
9. What percentage of the tyres listed below are wider than 200mm? _____
10. What is the average width of the tyres listed below? _____

195/50 R15 77 V 225/40 R18 93 Y

215/45 R17 94 Z 205/55 R16 80 H

205/55 16 90 W 205/55 R15 86 V

195/60 15 80 V 225/45 17 93 Y

195/55 16 79 V 215/45 R17 90 Z

Use this information about the cost of buying and fitting tyres to answer the questions on page 41.

Tyre brand/model	Size	Price
Falken Sincera SN 828	175/65 R14 T	£57.46
Falken ZE 512	195/50 R15 V	£60.30
Kumho Ecsta KH 11	185/55 R15 H	£78.90
Falken ZE 512	185/60 R14 H	£58.70
Kleber Dynaxer HP2	185/60 R14 H	£63.70
Kumho Ecsta KH 11	195/65 R15 H	£49.95
Falken ZE 512	195/55 R15 V	£51.33
Dunlop SP200	195/65 R15 V	£73.50
Kleber Dynaxer HP2	185/55 R15 H	£49.84
Falken ZE 512	205/60 R15 V	£50.61
Falken ZE 326	195/65 R15 V	£55.41
Nexen N 2000	195/60 R15 H	£42.65
Pirelli P6000	195/60 R15 H	£60.08
Falken ZE 512	205/55 R15 V	£60.76
Firestone F700	195/55 R15 V	£69.63
Falken ZE 512	205/50 R16 V	£63.00
Pirelli P6000	205/60 R15 V	£74.06
Kleber Dynaxer HP2	205/55 R16 H	£72.00
Falken GRB FK 451	225/40 R18 Y	£76.67
Dunlop SP Sport 01	205/50 R16 V	£182.65
Dunlop SP9000	215/45 R17 Z	£95.05
Yokohama AVS Sport	225/40 R18 Y	£128.30

Cost of valve and balance: £8.50 per tyre
 Cost of tyre disposal: £1.00 per tyre

For your convenience have our mobile van replace tyres at a location to suit you for an extra £20 per visit.

1. How much would two Falken ZE 512 size 195/50 R15V tyres cost including valve and balance and tyre disposal? _____

2. How much would four Dunlop SP9000 tyres cost to have fitted at your home and your old tyres disposed of? _____

3. What is the difference in price between the two 185/60 R14 H tyres? _____

4. How much would four of the cheapest tyres cost including valve and balance and disposal of your old tyres? _____

5. How much would four of the most expensive tyres cost including valve and balance and disposal of your old tyres? _____

6. If you had four Dunlop SP200 tyres fitted at your home, valve and balance and your old tyres disposed of, what percentage of the cost would the mobile service be? _____

7. You need two 195/60 R15 H tyres. How much would the cheapest option cost, including valve and balance? _____

8. You need four 205/60 R15 V tyres. How much would the dearest option cost, including valve and balance? _____

9. What is the average cost of the tyres in the list? _____

10. What percentage of the tyres cost less than £60 each? _____

Use this information about tyre pressures to answer the questions below and on page 43.

Inflation pressure conversion:

- PSI to BAR: divide by 14.7
- Bar to PSI multiply by 14.7
- Check when tyres are cold.

1. What is 1.95 bar as PSI?

2. What is 51 PSI as bar?

3. What is 5.50 bar as PSI?

4. What is 44 PSI as bar?

5. What is 1.30 bar as PSI?

6. What is 34 PSI as bar?

7. What is 3.90 bar as PSI?

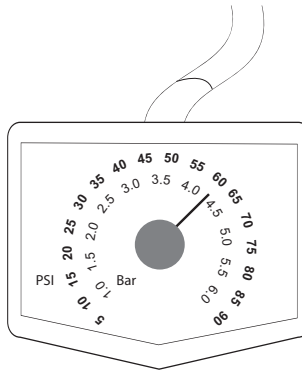
8. What is 40 PSI as bar?

9. What is 4.50 bar as PSI?

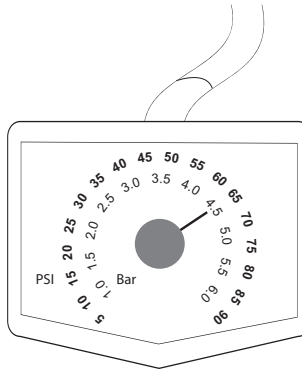
10. What is 2.20 bar as PSI?

Tyre pressures 2

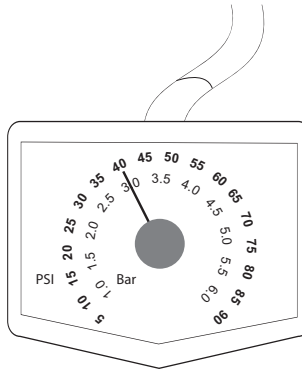
1. Your tyres should be 85 PSI.
Are they over- or under-inflated?
By how much?



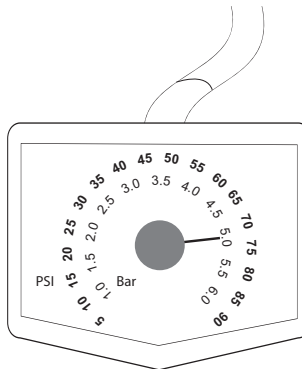
2. Your tyres should be 3.0 bar.
Are they over- or under-inflated?
By how much?



3. Your tyres should be 36 PSI.
Are they over- or under-inflated?
By how much?



4. Your tyres should be 5.5 bar.
Are they over- or under-inflated?
By how much?



Driving lessons 2, page 5

1. A-Class
2. £20
3. £19
4. £760
5. £1440
6. 10 = £21.40, 20 = £19.70,
30 = £19.30
7. 2 blocks of 20 basic lessons
8. Guaranteed pass, because it includes the test fee
9. 30 hours on the road plus 3 x 2-hour lessons
10. 40 hours on the road plus 5 x 2-hour lessons

Second-hand cars 2, page 7

1. 5 cars
2. 6 cars
3. 20%
4. $\frac{3}{10}$
5. 80%
6. £6000
7. £2,264.50
8. Volvo 340
9. Renault Clio, Volvo V40, Vauxhall Corsa, Renault Megane, Ford Focus, Peugeot 206, Honda Civic, Toyota Yaris, Mercedes C200, Vauxhall Astra
10. Renault Clio, Volvo V40, Honda Civic, Ford Focus/Vauxhall Corsa, Toyota Yaris, Mercedes C200, Peugeot 206, Vauxhall Astra

You can't rank the Renault Megane as the advert gives no indication of its age.

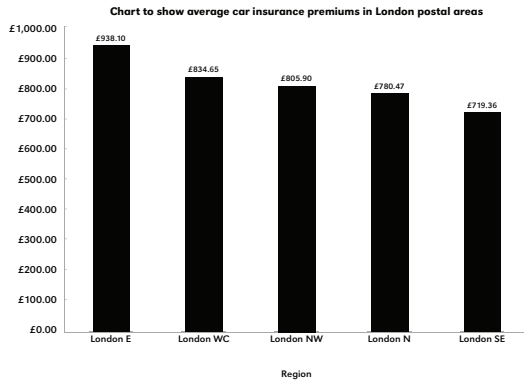
New cars 2, page 9

1. Audi A6
2. £3,493.45
3. £342.50
4. £715.98
5. £1255.84
6. £2838
7. £6,274.45
8. 3 years = £1701.20 interest
4 years = £1624.84 interest
5 years = £2838 interest
9. Audi A6 = £35,764.00
BMW = £26,474.40
Citroen = £12,540.00
Fiat = £11,378.80
Honda = £13,702.20
Nissan = £19,507.20
10. Car Finance

Car insurance 2, page 11

1. Perth
2. Ilford
3. £513.31
4. £86.54
5. £815.70
6. £304.98

7.



Penalty points and premiums, page 12

Insurer	Clean licence	2 speeding fines percentage increase	Actual cost increase
Halifax	£411.29	30%	£123.39
Swinton	£305.80	33%	£100.91
Santander	£335.09	17%	£56.97
esure	£239.86	25%	£59.97
Sheila's Wheels	£239.89	20%	£47.98
More Than	£381.84	13%	£49.64

1. esure
2. Halifax
3. £76.04
4. Swinton
5. £246.81

Insurance discounts, page 13

1. £585
2. £900
3. £297.50
4. £722.50
5. £850.50

Getting on the road, page 15

1. £1600.98
2. It halved
3. The Renault Clio
4. The Mini Cooper
5. The Volkswagen Golf
6. The Nissan Micra
7. Usually the higher the value of the car, the higher the cost of insurance
8. It is probably a very powerful, fast model.
9. $\frac{1}{5}$
10. 12%

Car tax 2, page 17

1. £140
2. £68.75
3. 111–120 g/km. She has a petrol/diesel car.
4. 131–140 g/km. He has an alternative fuel car.
5. £140
6. £10.50
7. £12.50
8. 62p
9. 29p
10. £00–£175

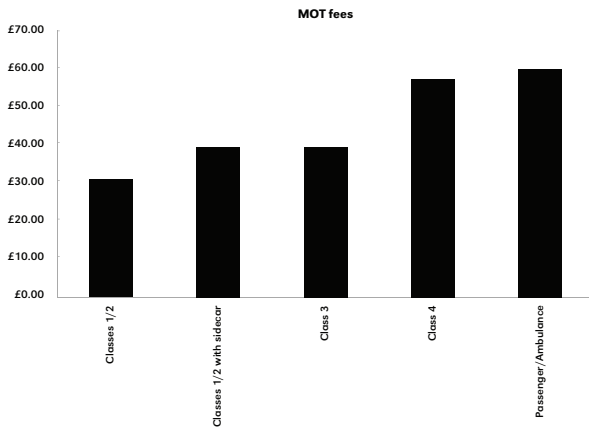
MOT costs 2, page 19

1. Private passenger vehicles, taxis and ambulances

2. £57.30

3. £8.15

4.



4. £2049

5. £9040

6. £3487.50

7. £3705

8. £739.50

9. £543.60

10. £7089

Fuel costs 2, page 21

1. 131.9–148.9p

2. East Anglia

3. Midlands and North West

4. 7.9p

5. 137p

6. £61.61

7. £41.07

8. £1.02

9. 74p

10. 76p

Running costs 2, page 23

1. £840

2. £3713

3. 10.79p

Fuel consumption 2, page 25

1. Range Rover Sport

2. Peugeot 107

3. 0.71 gallons

4. 5.59 gallons

5. 36.2 miles per gallon more

6. 19.8 miles per gallon less

7. 756 miles

8. 772 miles

9. 9.7 gallons

10. Generally, the higher the emissions the fewer miles per gallon

Miles per hour 1, page 26

1. 64.36 kilometres

2. 40.39 miles

3. 40.22 kilometres

4. 31.07 miles

5. 128.72 kilometres

6. 248.56 miles

7. 611.42 kilometres

8. 55.93 miles

Miles per hour 2, page 27

Miles per hour	Kilometres per hour
20	32
30	48
31	50
37	60
40	64
43	70
50	80
50	80
56	90
60	97
62	100
68	110
70	113
75	120
81	130

Stopping 2, page 29

- 15 metres
- 75 metres
- 36 metres
- 60mph
- 40mph
- 70mph
- 24 car lengths
- 3 car lengths
- 6 car lengths
- 9¹/₂ lengths

Speed limits 2, page 31

- 30mph
- 70mph
- 60mph
- 10mph
- 20mph
- 60mph
- 60mph
- 30–70mph
- 10mph
- 15mph

Fines and points 2, page 33

- Failing to stop after an accident, failing to report an accident, driving with excess alcohol/drugs and after driving refusing to supply specimens for analysis and having no insurance.
- 10 points
- 4 points
- You'll get between 3–6 points on your licence, a fine of up to £2,500 and you will probably be disqualified from driving.
- 0 points
- 12 points
- 6 points
- £6,000
- £2884.62
- 15.4%

Journey times 1, page 34

1. 84 miles
2. 112 miles
3. 48 miles
4. London to Inverness – 569 miles
5. Perth to Pitlochry – 26 miles
6. 86 miles

4. 56mph
5. 55% of 205mm
6. 225/45 R17 93 Y
7. 225/45 R17 93 Y
8. 60%
9. 70%
10. 208mm

Journey times 2, page 35

1. 8.40am
2. 1.20pm
3. 4pm
4. 2.30pm
5. 24mph
6. 30mph
7. 52mph
8. 70mph

Tyre costs 2, page 41

1. £139.60
2. £404.20
3. £5.00
4. £208.60
5. £768.60
6. 5.7%
7. £102.30
8. £300.24
9. £71.57
10. 36%

Liquids for the car, page 37

1. a
2. a and b
3. 750ml
4. 225ml
5. 2.8 litres

Tyre pressures 1, page 42

1. 29 PSI
2. 3.47 bar
3. 81 PSI
4. 3.0 bar
5. 19 PSI
6. 2.31 bar
7. 57 PSI
8. 2.72 bar

Tyre deciphering 2, page 39

1. 205mm
2. 437kg
3. 168mph

9. 66 PSI

10. 32 PSI

Tyre pressures 2, page 43

1. Under-inflated by 25 PSI
2. Over-inflated by 1.5 bar
3. Over-inflated by 4 PSI
4. Under-inflated by 0.5 bar

The activities in *Everyday maths problems on the road* have been carefully designed to practise everyday maths skills in a way that is true to life and meaningful for students. The activities principally target skills at Functional Skills Level 1. The books are suitable for secondary school students aged 11+ as well as for students in further education. Mapping to Functional Skills Standards and the 2014 National Curriculum is available electronically. For a copy please email enquiries@axiseducation.co.uk.

Everyday maths problems on the road is not intended to be used as a teaching programme to be followed from beginning to end. Teachers should dip in and out of the book according to student need and interest. You may need to spend time before each activity explaining any difficult terms or unfamiliar vocabulary.

Locating tasks

To make task selection easier there are two routes to finding them:

1. Activities index. The types of activities on each page are indexed on pages 50–51.
2. Topic index. The topics covered are indexed on page 51.

Numeracy activities

Addition

4–5, 8–9, 14–15, 32–33, 34, 40–41

Averages

6–7, 10–11, 16–17, 20–21, 22–23, 30–31, 32–33, 35, 40–41

Bar charts

10–11, 18–19

Comparing numbers

6–7, 8–9, 10–11, 12, 24–25, 28–29, 34

Division

16–17, 24–25, 28–29, 42

Fractions

6–7, 14–15

Handling data in lists

10–11, 12, 13, 14–15, 18–19, 20–21, 40–41

Handling data in tables

8–9, 16–17, 22–23, 28–29, 30–31, 32–33, 34, 34–35, 36–37

Money

4–5, 6–7, 8–9, 10–11, 12–13, 14–15, 16–17, 18–19, 20–21, 22–23, 24–25, 32–33, 36–37, 40–41

Multiplication

8–9, 20–21, 22–23, 24–25, 42

Percentages

6–7, 12, 13, 14–15, 20–21, 32–33, 38–39, 40–41

Price comparisons

4–5, 6–7, 8–9, 10–11, 12, 14–15, 24–25, 40–41

Ratio

36–37

Reading gauges

36–37, 43

Rounding

4–5, 8–9, 16–17

Subtraction

6–7, 10–11, 12, 16–17, 18–19, 20–21, 24–25, 30–31, 34, 35, 36–37, 38–39, 40–41

Time

6-7, 35

Weights and measures

20-21, 24-25, 26-27, 28-29, 30-31, 34, 35, 36-37, 38-39, 42, 43

Topic index

Buying a car

6-7, 8-9, 14-15

Car tax

16-17

Distances

26-27

Driving lessons

4-5

Fuel consumption

24-25

Fuel costs

20-21

Insurance

10-11, 12, 14-15

Journey times

34-35

Liquids for the car

36-37

Loans

8-9

MOT

18-19

Penalty points

12-13, 32-33

Running costs

22-23

Speed limits

30-31

Stopping distances

28-29

Tyres

38-39, 40-41, 42-43