

Name:

Exam Style Questions

Reverse Percentages



Corbettmaths

Equipment needed: Calculator, pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Video Tutorial

www.corbettmaths.com/contents

Video 240



Answers and Video Solutions



1. Patrick invested money into a special savers bank account.
Each year money in the account earns 4% interest.



After one year, the total amount of money in the account was £291.20

How much did Patrick invest?

$$291.20 \div 1.04 = \underline{\underline{280}}$$

or

$$\begin{array}{l}
 104\% \rightarrow 291.20 \\
 \div 104 \downarrow \quad \downarrow \div 104 \\
 1\% \rightarrow 2.80 \\
 \times \downarrow \quad \downarrow \times 100 \\
 100 \rightarrow \underline{\underline{280}}
 \end{array}$$

£ 280
(3)

2. The population of Sandcliff has decreased by 2% over the past year.
The population of Sandcliff this year is 52920



Calculate the population of Sandcliff last year.

$$52920 \div 0.98 = \underline{\underline{54000}}$$

or

$$\begin{array}{l}
 52920 \rightarrow 98\% \\
 \div 98 \downarrow \quad \downarrow \div 98 \\
 540 \rightarrow 1\% \\
 \times 100 \downarrow \quad \downarrow \times 100 \\
 \underline{\underline{54000}} \rightarrow 100\%
 \end{array}$$

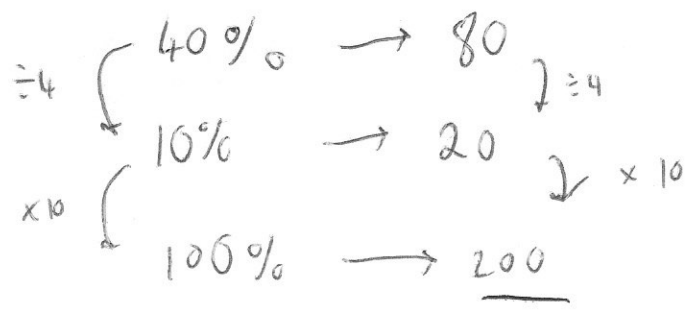
54000
(3)

3. A box contains red and yellow marbles.
40% of the marbles in the box are yellow.



There are 80 yellow marbles in the box.

Work out the total number of marbles in the box.



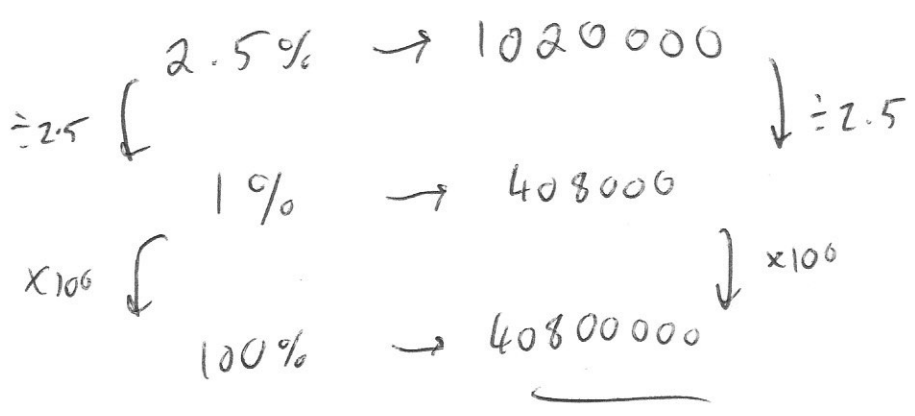
or $80 \div 0.4 = \underline{200}$

200
(2)

4. Ottawa is the capital city of Canada.
The population of Ottawa is 1,020,000.
This population is 2.5% of the total population of Canada.



What is the total population of Canada?



or $1\,020\,000 \div 0.025 = \underline{40\,800\,000}$

40,800,000
(3)

5. A lamp is on sale at £22.05
This is a 10% reduction of the normal price.



What was the price of the lamp before the reduction?

$$22.05 \div 0.9 = \underline{\underline{£24.50}}$$

or

$$\begin{array}{ccc} 90\% & \rightarrow & 22.05 \\ \div 90 \downarrow & & \downarrow \div 90 \end{array}$$

$$\begin{array}{ccc} 1\% & \rightarrow & 0.245 \\ \times 100 \downarrow & & \downarrow \times 100 \end{array}$$

$$100\% \rightarrow \underline{\underline{£24.50}}$$

$$\begin{array}{r} \text{£} \quad 24.50 \\ \hline \end{array} \quad (3)$$

6. Jacob buys a watch costing £84
This cost includes VAT at a rate of 20%.



How much is the watch without VAT?

$$\begin{array}{ccc} 120\% & \rightarrow & 84.00 \\ \div 12 \downarrow & & \downarrow \div 12 \\ 10\% & \rightarrow & 7 \\ \downarrow & & \downarrow \\ \times 10 & & \times 10 \\ 100\% & \rightarrow & \underline{\underline{£70}} \end{array}$$

or

$$84 \div 1.2$$

$$840 \div 12$$

$$\begin{array}{r} 070 \\ 12 \overline{)840} \\ \underline{84} \\ 0 \\ \underline{0} \\ 0 \\ \underline{0} \\ 0 \end{array}$$

$$\begin{array}{r} \text{£} \quad 70 \\ \hline \end{array} \quad (3)$$

7. A cafe sells 3 types of hot drinks: coffee, tea or hot chocolate.



On Tuesday morning, the cafe sold 96 coffees.
This was 60% of the total number of hot drinks sold.

Work out the total number of hot drinks sold on Tuesday morning.

$$\begin{array}{l} 60\% \rightarrow 96 \\ \div 6 \downarrow \\ 10\% \rightarrow 16 \\ \downarrow \times 10 \\ 100\% \rightarrow 160 \end{array}$$

or

$$96 \div 0.6$$

$$960 \div 6$$

$$\begin{array}{r} 160 \\ 6 \overline{) 960} \end{array}$$

$$\begin{array}{r} 160 \\ \hline \end{array} \quad (2)$$

8. Jennifer has 54 books.



This number of books is 80% more than the number she had last month.

How many books did Jennifer have last month?

$$54 \div 1.8 = 30$$

$$\begin{array}{l} \text{or} \\ 54 \rightarrow 180\% \\ \div 180 \downarrow \quad \downarrow \div 180 \\ 0.3 \rightarrow 190 \\ \downarrow \times 100 \quad \downarrow \times 100 \\ 30 \rightarrow 180\% \end{array}$$

$$\begin{array}{r} 30 \\ \hline \end{array} \quad (3)$$

9. Lauren is given a 12% pay rise.
Her new salary is £24,080



What was Lauren's salary before the pay rise?

$$24080 \div 1.12 = 21500$$

$$112\% \rightarrow 24080$$

$$1\% \rightarrow 215$$

$$100\% \rightarrow 21500$$

$$\begin{array}{r} \text{£ } 21500 \\ \hline (3) \end{array}$$

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10. A limited edition bag of flour contains 25% more than the standard bag.
The limited edition bag contains 650g of flour.



How much flour is in the standard bag?

$$650 \div 1.25 = 520$$

or
✓

$$125\% \rightarrow 650\text{g}$$

$$1\% \rightarrow 5.2\text{g}$$

$$100\% \rightarrow 520\text{g}$$

$$\begin{array}{r} 520 \\ \hline \text{g} \\ (3) \end{array}$$

11. A fish tank sprung a leak and loses 45% of its water.
There is now 363 litres of water in the fish tank.



How much water was in the fish tank before the leak?

$$\begin{array}{l}
 \div 55 \quad \left\{ \begin{array}{l} 55\% \rightarrow 363 \\ 1\% \rightarrow 6.6 \end{array} \right. \div 55 \\
 \times 100 \quad \left\{ \begin{array}{l} 100\% \rightarrow 660 \text{ litres} \end{array} \right. \times 100
 \end{array}$$

or

$$363 \div 0.55 = 660$$

$$\begin{array}{r}
 660 \\
 \hline
 (3)
 \end{array}$$

12. Mrs Reed buys a van costing £11760
This cost includes VAT at a rate of 20%.



How much is the VAT?

$$120\% \rightarrow 11760$$

$$1\% \rightarrow 98$$

$$100\% \rightarrow \pounds 9800$$

$$11760 - 9800 = 1960$$

or

$$11760 \div 1.2 = 9800$$

$$9800 \times 0.2 = 1960$$

$$120\% = 11760$$

$$1\% = 98$$

$$20\% = 1960$$

or

$$\begin{array}{r}
 \pounds 1960 \\
 \hline
 (3)
 \end{array}$$

13. In a sale the price of a sofa is reduced by 70%.
The sale price is £255



Work out the price before the sale.

$$30\% \Rightarrow \text{£}255$$

$$1\% \rightarrow 8.5$$

$$100\% \rightarrow 850$$

or

$$255 \div 0.3 = 850$$

£ 850
(3)

14. Cormac buys a new bicycle.



He has a voucher that gives him 6% off the usual price.
Cormac pays £799 for the bicycle.

Work out how much money Cormac saved by using the voucher.

$$799 \div 0.94 = 850$$

$$850 - 799 = 51$$

or

$$94\% \rightarrow 799$$

$$1\% \rightarrow 8.5$$

$$100\% \rightarrow 850$$

$$850 - 799$$

£ 51
(3)

15. Rosie sold her house for £180000



The price of her house depreciated by 6.25% since Rosie originally bought it.

Work out how much Rosie originally paid for the house.

$$1 - 0.0625 = 0.9375$$

$$180000 \div 0.9375 = \underline{192000}$$

or

$$100 - 6.25 = 93.75$$

$$93.75\% \rightarrow 180000$$

$$1\% \rightarrow 1920$$

$$100\% \rightarrow \underline{192000}$$

£ 192000
(3)

16. The number of visitors to a museum increased 16.4% between 2022 and 2023.



The number of visitors in 2023 was 97776.

Calculate the number of visitors in 2022.

$$97776 \div 1.164 = \underline{84000}$$

or

$$116.4\% \rightarrow 97776$$

$$1\% \rightarrow 840$$

$$100\% \rightarrow \underline{84000}$$

84000
(2)

17. Lukas cycled 10% further in October than September.



Lukas cycled 308km in October.

$$\begin{array}{r} 028 \\ 11 \overline{)308} \\ \underline{33} \\ 78 \\ \underline{77} \\ 10 \end{array}$$

Work out how much further Lukas cycled in October than September

$$\begin{array}{l} \div 11 \downarrow \quad 110\% \rightarrow 308 \quad \downarrow \div 11 \\ \quad \quad \quad 10\% \rightarrow 28 \quad \quad \quad \downarrow \times 10 \\ \quad \quad \quad 100\% \rightarrow 280 \end{array}$$
$$308 - 280 = 28 \text{ km}$$

$$\begin{array}{r} 28 \text{ km} \\ \hline (3) \end{array}$$

18. Emilia saves £350 each month for a year towards a car.



She buys the car by paying a deposit and 60 monthly payments of £180

Emilia uses the money she saved to pay 80% of the deposit.

Work out the total cost of the car.

$$350 \times 12 = 4200$$

$$60 \times 180 = 10800$$

$$80\% \rightarrow 4200$$

$$1\% \rightarrow 52.5$$

$$100\% \rightarrow 5250$$

$$5250 + 10800 = 16050$$

$$\begin{array}{r} £16050 \\ \hline (4) \end{array}$$

19. Aisha bought a house two years ago.



The value of the house increased by 10% over the first year.
The value then increased by 8% the following year.

The house is now valued at £291060

Work out how much Aisha paid for the house two years ago.

$$291060 \div 1.08 = 269500$$

$$269500 \div 1.1 = 245000$$

245000

(3)

20. There are 6000 people at an ice hockey match.



The announcer says this is exactly 40% more people than the previous match.

Explain why the announcer is incorrect.

$$140\% \rightarrow 6000$$

$$1\% \rightarrow 42.857\dots$$

$$100\% \rightarrow 4285.71\dots$$

Since this is not a whole number, the
announcer must be wrong.

(4)

21. Cillian has saved 79% more money than his brother, Rufus.



Altogether they have £1618.20 in savings.

Work out how much money Cillian has saved.

$$179 + 100 = 279\%$$

$$279\% \rightarrow 1618.20$$

$$1\% \rightarrow 5.8$$

$$100\% \rightarrow 580$$

$$179\% \rightarrow 1038.20$$

$$\underline{\underline{£1038.20}}$$

(4)

22. Lorcan has red and green apples.
A quarter of the apples are green.



Lorcan puts the apples in two boxes, A and B.

65% of the green apples are placed in box A.
There are 133 green apples are in box B.

Work out how many red apples Lorcan has.

$$35\% \rightarrow 133$$

$$1\% \rightarrow 3.8$$

$$100\% \rightarrow 380 \text{ green apples}$$

$$380 \times 3 = 1140$$

$$\underline{\underline{1140}}$$

(4)

23. A football team has won 12% of the matches that they have ever played.



They have drawn a quarter of the rest of the matches.

The football team have lost 924 matches.

Work out the total number of matches played by the football team.

$$12\% \text{ won} \quad 88\% \text{ "not won"}$$

$$\frac{1}{4} \text{ of } 88\% = 22\% \text{ drawn}$$

$$12 + 22 = 34$$

$$100 - 34 = 66\%$$

$$924 \div 0.66 = 1400$$

or

$$\begin{array}{l} 924 \rightarrow 66\% \\ 14 \rightarrow 1\% \\ \hline 1400 \rightarrow 100\% \end{array}$$

1400

(4)

24. Amie and Poppy were both given a pay rise.



Amie was given a 25% pay rise and Poppy a 4% pay rise.

The ratio of Amie's salary to Poppy's salary is now 9:13

Poppy's pay before the pay rise was £50000

Work out Amie's pay before the pay rise.

$$50000 \times 1.04 = 52000$$

$$52000 \div 13 = 4000$$

$$4000 \times 9 = 36000$$

$$36000 \div 1.25 = 28800$$

£28800

(5)