

Fractions, Decimals and Percentages Word Problems

Bronze

1. A bag contains red and yellow beads. $\frac{1}{2}$ of the beads are red. Given that there are 18 beads in the bag, calculate the number of beads that are red.
2. In a class of 20 students, $\frac{1}{4}$ have a younger sibling. How many students in the class have a younger sibling?
3. During a sale, all items are advertised at 10% off the retail price. A coat usually costs £60. Work out the discount on this item.
4. A piece of ribbon measures 80cm. 10% of the ribbon is cut off. What length of ribbon is cut off?
5. In a survey, nine out of ten people said that they preferred summer over winter. Write this as a decimal.
6. A bag is advertised as having 20% off the retail price. If the bag usually costs £40, work out the discount.
7. There are 36 biscuits in a biscuit tin. Bella eats $\frac{1}{3}$ of the biscuits. How many biscuits does Bella eat?
8. In a group of school children, only 72% remember to bring a pencil to school. What percentage of students did not remember to bring a pencil?
9. A headteacher carries out a survey. He asks 1000 students what their favourite subject is. 700 students say that their favourite subject is maths. What fraction of students in this school say that their favourite subject is maths? Give your answer in its simplest form.
10. At a theme park, four out of every five people choose to buy a fast pass. What is this as a percentage?
11. In a leisure centre, 18% of people are swimming, 25% of people are in a fitness class and the rest are in the gym. What percentage of people at the leisure centre are in the gym?

Fractions, Decimals and Percentages Word Problems Bronze

12. A bag of sweets contains 20 packets. $\frac{3}{4}$ of the packets are gummy sweets and the rest are hard-boiled. How many packets of gummy sweets are in the bag?
13. Maisie slices her birthday cake into several pieces. One slice is 10% of the whole cake and a different slice is $\frac{1}{8}$ of the whole cake. Which slice is larger? You must give a reason for your answer.
14. A coat is reduced in a sale by 10%. Given that the usual price of the coat is £120, calculate the sale price.
15. In a class of 30 students, $\frac{1}{5}$ go on a school trip. How many students do not go on the school trip?

Challenge:

Julia buys a car costing £8000. Each year, the car depreciates (goes down in value) by 10%. How much is the car worth after three years?

Fractions, Decimals and Percentages Word Problems

Bronze **Answers**

1. A bag contains red and yellow beads. $\frac{1}{2}$ of the beads are red. Given that there are 18 beads in the bag, calculate the number of beads that are red.

$$18 \div 2 = 9$$

2. In a class of 20 students, $\frac{1}{4}$ have a younger sibling. How many students in the class have a younger sibling?

$$20 \div 4 = 5$$

3. During a sale, all items are advertised at 10% off the retail price. A coat usually costs £60. Work out the discount on this item.

$$£60 \div 10 = £6$$

4. A piece of ribbon measures 80cm. 10% of the ribbon is cut off. What length of ribbon is cut off?

$$80\text{cm} \div 10 = 8\text{cm}$$

5. In a survey, nine out of ten people said that they preferred summer over winter. Write this as a decimal.

$$9 \div 10 = 0.9$$

6. A bag is advertised as having 20% off the retail price. If the bag usually costs £40, work out the discount.

$$£40 \div 10 = £4$$

$$£4 \times 2 = £8$$

7. There are 36 biscuits in a biscuit tin. Bella eats $\frac{1}{3}$ of the biscuits. How many biscuits does Bella eat?

$$36 \div 3 = 12$$

8. In a group of school children, only 72% remember to bring a pencil to school. What percentage of students did not remember to bring a pencil?

$$100\% - 72\% = 28\%$$

9. A headteacher carries out a survey. He asks 1000 students what their favourite subject is. 700 students say that their favourite subject is maths. What fraction of students in this school say that their favourite subject is maths? Give your answer in its simplest form.

$$\frac{700}{1000} = \frac{7}{10}$$

10. At a theme park, four out of every five people choose to buy a fast pass. What is this as a percentage?

$$4 \div 5 \times 100 = 80\%$$

11. In a leisure centre, 18% of people are swimming, 25% of people are in a fitness class and the rest are in the gym. What percentage of people at the leisure centre are in the gym?

$$100\% - 18\% - 25\% = 57\%$$

12. A bag of sweets contains 20 packets. $\frac{3}{4}$ of the packets are gummy sweets and the rest are hard-boiled. How many packets of gummy sweets are in the bag?

$$20 \div 4 = 5$$

$$3 \times 5 = 15$$

13. Maisie slices her birthday cake into several pieces. One slice is 10% of the whole cake and a different slice is $\frac{1}{8}$ of the whole cake. Which slice is larger? You must give a reason for your answer.

$$\frac{1}{8} = 12.5\%$$

The $\frac{1}{8}$ slice is larger (or other suitable explanation).

14. A coat is reduced in a sale by 10%. Given that the usual price of the coat is £120, calculate the sale price.

$$£120 \div 10 = £12$$

$$£120 - £12 = £108$$

15. In a class of 30 students, $\frac{1}{5}$ go on a school trip. How many students do not go on the school trip?

$$30 \div 5 = 6$$

$$30 - 6 = 24 \text{ (or other suitable method).}$$

Challenge:

Julia buys a car costing £8000. Each year, the car depreciates (goes down in value) by 10%. How much is the car worth after three years?

$$£8000 \div 10 = £800$$

$$£8000 - £800 = £7200$$

$$£7200 \div 10 = £720$$

$$£7200 - £720 = £6480$$

$$£6480 \div 10 = £648$$

$$£6480 - £648 = £5832 \text{ (or other suitable method).}$$

Fractions, Decimals and Percentages Word Problems Gold

1. A bag contains red and yellow beads. $\frac{3}{5}$ of the beads are red. Given that there are nine red beads, calculate the total number of beads in the bag.
2. In a class, $\frac{2}{7}$ of the students have a younger sibling. Given that 25 students do not have a younger sibling, calculate the total number of students in the class.
3. During a sale, all items are advertised at 10% off the retail price. A coat costs £54 in the sale. Work out the original price of the coat.
4. Jonny has a length of ribbon. He cuts off 15% of the ribbon, leaving a piece measuring 68cm. What was the original length of the ribbon?
5. In a survey, 11 out of 25 people said that they preferred summer over winter. Write this as a decimal.
6. The length of a rectangle increases by 10% and its height increases by 5%. Work out the total percentage increase in the area of the rectangle.
7. In a biscuit tin, 15% of the biscuits are chocolate, $\frac{1}{4}$ are plain and the rest are oat biscuits. Given that 36 biscuits are oat biscuits, work out the total number of biscuits in the tin.
8. In a group of school children, only 72% remember to bring a pencil to school. Of the remaining students, 10% remembered to bring a pen. What percentage of students in the school did not remember to bring a pen or a pencil to school?
9. A headteacher carries out a survey. He asks 800 students what their favourite subject is. 425 students say that their favourite subject is maths. What proportion of students in this school say that their favourite subject is maths? Give your answer as a decimal.
10. At a theme park, seven out of every 40 people choose to buy a fast pass. What is this as a percentage?

Fractions, Decimals and Percentages - Word Problems: Gold

11. In a leisure centre, 25% of people are swimming. The rest of the people are either in a fitness class or the gym. Given that the ratio of people in a fitness classes to the gym is 3:2, work out the percentage of people at the leisure centre that are in the gym.
12. In a bag of sweets, $\frac{1}{4}$ of the packets are gummy sweets, $\frac{2}{5}$ are marshmallows and the rest are hard-boiled. Given that seven sweets are hard-boiled, work out the total number of sweets in the bag.
13. Maisie slices her birthday cake into several pieces. One slice is 0.18 of the whole cake and a different slice is $\frac{4}{25}$ of the whole cake. Which slice is larger? Give a reason for your answer.
14. A coat is reduced in a sale by 18%. Given that the sale price of the coat is £65.60, calculate the original price.
15. In a class, 10% of the students stay at home while $\frac{5}{6}$ of the students go on a trip. The rest of the students stay at school. Given that 2 students stay at school, work out the total number of students in the class.

Challenge:

Julia buys a car costing £8000. Each year, the car depreciates (goes down in value) by 15%. After how many years is the car worth less than £5000?

Fractions, Decimals and Percentages Word Problems

Gold Answers

1. A bag contains red and yellow beads. $\frac{3}{5}$ of the beads are red. Given that there are nine red beads, calculate the total number of beads in the bag.

$$9 \div 3 = 3$$

$$3 \times 5 = 15$$

2. In a class, $\frac{2}{7}$ of the students have a younger sibling. Given that 25 students do not have a younger sibling, calculate the total number of students in the class.

$$25 \div 5 = 5$$

$$5 \times 7 = 35$$

3. During a sale, all items are advertised at 10% off the retail price. A coat costs £54 in the sale. Work out the original price of the coat.

$$\text{£}54 \div 0.9 = \text{£}60$$

4. Jonny has a length of ribbon. He cuts off 15% of the ribbon, leaving a piece measuring 68cm. What was the original length of the ribbon?

$$68\text{cm} \div 0.85 = 80\text{cm}$$

5. In a survey, 11 out of 25 people said that they preferred summer over winter. Write this as a decimal.

$$11 \div 25 = 0.44$$

6. The length of a rectangle increases by 10% and its height increases by 5%. Work out the total percentage increase in the area of the rectangle.

$$1.1 \times 1.05 = 1.155$$

15.5% increase.

7. In a biscuit tin, 15% of the biscuits are chocolate, $\frac{1}{4}$ are plain and the rest are oat biscuits. Given that 36 biscuits are oat biscuits, work out the total number of biscuits in the tin.

$$15\% + 25\% = 40\%$$

$$100\% - 40\% = 60\%$$

$$36 \div 60 \times 100 = 60$$

8. In a group of school children, only 72% remember to bring a pencil to school. Of the remaining students, 10% remembered to bring a pen. What percentage of students in the school did not remember to bring a pen or a pencil to school?

$$100\% - 72\% = 28\%$$

$$10\% \text{ of } 28\% = 2.8\%$$

$$28\% - 2.8\% = 25.2\%$$

9. A headteacher carries out a survey. He asks 800 students what their favourite subject is. 425 students say that their favourite subject is maths. What proportion of students in this school say that their favourite subject is maths? Give your answer as a decimal.

$$425 \div 800 = 0.53125$$

10. At a theme park, seven out of every 40 people choose to buy a fast pass. What is this as a percentage?

$$7 \div 40 \times 100 = 17.5\%$$

11. In a leisure centre, 25% of people are swimming. The rest of the people are either in a fitness class or the gym. Given that the ratio of people in a fitness classes to the gym is 3:2, work out the percentage of people at the leisure centre that are in the gym.

$$100\% - 25\% = 75\%$$

$$75\% \div 5 = 15\%$$

$$15\% \times 2 = 30\%$$

12. In a bag of sweets, $\frac{1}{4}$ of the packets are gummy sweets, $\frac{2}{5}$ are marshmallows and the rest are hard-boiled. Given that seven sweets are hard-boiled, work out the total number of sweets in the bag.

$$\frac{1}{4} + \frac{2}{5} = \frac{13}{20}$$

$$1 - \frac{13}{20} = \frac{7}{20}$$

There are 20 sweets in the bag.

13. Maisie slices her birthday cake into several pieces. One slice is 0.18 of the whole cake and a different slice is $\frac{4}{25}$ of the whole cake. Which slice is larger? Give a reason for your answer.

$$\frac{4}{25} = 16\%$$

The 0.18 slice is larger (or other suitable explanation).

14. A coat is reduced in a sale by 18%. Given that the sale price of the coat is £65.60, calculate the original price.

$$£65.60 \div 0.82 = £80$$

15. In a class, 10% of the students stay at home while $\frac{5}{6}$ of the students go on a trip. The rest of the students stay at school. Given that 2 students stay at school, work out the total number of students in the class.

$$\frac{1}{10} + \frac{5}{6} = \frac{14}{15}$$

$$1 - \frac{14}{15} = \frac{1}{15}$$

$$15 \times 2 = 30$$

Challenge:

Julia buys a car costing £8000. Each year, the car depreciates (goes down in value) by 15%. After how many years is the car worth less than £5000?

$$15\% \text{ of } \pounds 8000 = \pounds 1200$$

$$\pounds 8000 - \pounds 1200 = \pounds 6800$$

$$15\% \text{ of } \pounds 6800 = \pounds 1020$$

$$\pounds 6800 - \pounds 1020 = \pounds 5780$$

$$15\% \text{ of } \pounds 5780 = \pounds 867$$

$$\pounds 5780 - \pounds 867 = \pounds 4913$$

3 years (or other suitable method).

Fractions, Decimals and Percentages Word Problems

Silver

1. A bag contains red and yellow beads. $\frac{3}{5}$ of the beads are red. Given that there are 25 beads in the bag, calculate the number of beads that are red.
2. In a class of 28 students, $\frac{2}{7}$ have a younger sibling. How many students in this class have a younger sibling?
3. During a sale, all items are advertised at 10% off the retail price. A coat usually costs £60. Work out the sale price of the coat.
4. A piece of ribbon measures 80cm. 15% of the ribbon is cut off. What length of ribbon is left?
5. In a survey, three out of five people said that they preferred summer over winter. Write this as a decimal.
6. A bag is advertised as having 20% off the retail price. If the bag usually costs £40, work out the sale price of the bag.
7. There are 36 biscuits in a biscuit tin. Bella eats $\frac{1}{3}$ of the biscuits. How many biscuits does Bella eat?
8. In a group of school children, 72% remember to bring a pencil to school, another 13% brought a pen and the rest forgot to bring either item. What percentage of students did not remember to bring a pencil or pen?
9. A headteacher carries out a survey. She asks 800 students what their favourite subject is. 500 students say that their favourite subject is maths. What proportion of students in this school say that their favourite subject is maths? Give your answer as a decimal.
10. At a theme park, eight out of every 20 people choose to buy a fast pass. What is this as a percentage?
11. In a leisure centre, 25% of people are swimming. The rest of the people are either in a fitness class or the gym. Given the number of people in a fitness class is double the number that are in the gym, work out the percentage of people at the leisure centre that are in the gym.

Fractions, Decimals and Percentages - Word Problems: Silver

12. A bag of sweets contains 20 packets. $\frac{1}{4}$ of the packets are gummy sweets, $\frac{2}{5}$ are marshmallows and the rest are hard-boiled. How many packets of hard-boiled sweets are in the bag?
13. Maisie slices her birthday cake into several pieces. One slice is 12% of the whole cake and a different slice is $\frac{2}{25}$ of the whole cake. Which slice is larger? You must show your working.
14. A coat is reduced in a sale by 18%. Given that the normal price of the coat is £80, calculate the sale price.
15. In a class of 30 students, 10% stay at home while $\frac{5}{6}$ of the students go on a trip. The rest of the students stay at school. How many students stay at school?

Challenge:

Julia buys a car costing £8000. Each year, the car depreciates (goes down in value) by 15%. How much is the car worth after three years?

Fractions, Decimals and Percentages Word Problems

Silver Answers

1. A bag contains red and yellow beads. $\frac{3}{5}$ of the beads are red. Given that there are 25 beads in the bag, calculate the number of beads that are red.

$$25 \div 5 = 5 \quad 3 \times 5 = 15$$

2. In a class of 28 students, $\frac{2}{7}$ have a younger sibling. How many students in this class have a younger sibling?

$$28 \div 7 = 4 \quad 2 \times 4 = 8$$

3. During a sale, all items are advertised at 10% off the retail price. A coat usually costs £60. Work out the sale price of the coat.

$$£60 \div 10 = £6$$

$$£60 - £6 = £54$$

4. A piece of ribbon measures 80cm. 15% of the ribbon is cut off. What length of ribbon is left?

$$80\text{cm} \div 10 = 8\text{cm}$$

$$8\text{cm} \times 2 = 16\text{cm}$$

$$80\text{cm} - 16\text{cm} = 64\text{cm}$$

$$80\text{cm} - 16\text{cm} = 64\text{cm}$$

5. In a survey, three out of five people said that they preferred summer over winter. Write this as a decimal.

$$3 \div 5 = 0.6$$

6. A bag is advertised as having 20% off the retail price. If the bag usually costs £40, work out the sale price of the bag.

$$£40 \div 10 = £4$$

$$£4 \times 2 = £8$$

$$£40 - £8 = £32$$

7. There are 36 biscuits in a biscuit tin. Bella eats $\frac{1}{3}$ of the biscuits. How many biscuits does Bella eat?

$$36 \div 3 = 12$$

8. In a group of school children, 72% remember to bring a pencil to school, another 13% brought a pen and the rest forgot to bring either item. What percentage of students did not remember to bring a pencil or pen?

$$100\% - 72\% - 13\% = 15\%$$

9. A headteacher carries out a survey. She asks 800 students what their favourite subject is. 500 students say that their favourite subject is maths. What proportion of students in this school say that their favourite subject is maths? Give your answer as a decimal.

$$500 \div 800 = 0.625$$

10. At a theme park, eight out of every 20 people choose to buy a fast pass. What is this as a percentage?

$$8 \div 20 \times 100 = 40\%$$

11. In a leisure centre, 25% of people are swimming. The rest of the people are either in a fitness class or the gym. Given the number of people in a fitness class is double the number that are in the gym, work out the percentage of people at the leisure centre that are in the gym.

$$100\% - 25\% = 75\%$$

$$75\% \div 3 = 25\%$$

12. A bag of sweets contains 20 packets. $\frac{1}{4}$ of the packets are gummy sweets, $\frac{2}{5}$ are marshmallows and the rest are hard-boiled. How many packets of hard-boiled sweets are in the bag?

$$\frac{1}{4} \text{ of } 20 = 5$$

$$\frac{2}{5} \text{ of } 20 = 8$$

$$20 - 5 - 8 = 7$$

13. Maisie slices her birthday cake into several pieces. One slice is 12% of the whole cake and a different slice is $\frac{2}{25}$ of the whole cake. Which slice is larger? You must show your working.

$$\frac{2}{25} = 8\%$$

The 12% slice is larger (or other suitable explanation).

14. A coat is reduced in a sale by 18%. Given that the normal price of the coat is £80, calculate the sale price.

$$18\% \text{ of } £80 = £14.40$$

$$£80 - £14.40 = £65.60$$

15. In a class of 30 students, 10% stay at home while $\frac{5}{6}$ of the students go on a trip. The rest of the students stay at school. How many students stay at school?

$$10\% \text{ of } 30 = 3$$

$$\frac{5}{6} \text{ of } 30 = 25$$

$$30 - 3 - 25 = 2 \text{ (or other suitable method).}$$

Challenge:

Julia buys a car costing £8000. Each year, the car depreciates (goes down in value) by 15%. How much is the car worth after three years?

$$15\% \text{ of } £8000 = £1200$$

$$£8000 - £1200 = £6800$$

$$15\% \text{ of } £6800 = £1020$$

$$£6800 - £1020 = £5780$$

$$15\% \text{ of } £5780 = £867$$

$$£5780 - £867 = £4913$$