Worksheet - Decimals and percentages

Year: Year 7 · 20

Show your working.

Question 1

Question 1 – Adding and subtracting decimals *(Section A · Skills practice)*

Work these out without a calculator. Line up the decimal points.

a. $4.75 + 3.6$
b. $12.3 - 5.78$
c. $0.906 + 2.14$
d. $20 - 7.365$
e. $15.4 + 8.07 + 0.9$

Question 2

Question 2 – Multiplying and dividing decimals *(Section A · Skills practice)*

Work these out. Show how you can use whole numbers to help.

a. 3.2×4
b. 0.6×0.7
c. 4.5×0.12
d. $7.2 \div 6$
e. $2.4 \div 0.08$
f. $0.045 \div 0.9$

Question 3

Question 3 – Fractions, decimals and percentages *(Section A · Skills practice)*

Complete the table by converting each number.

Fraction	Decimal	Percentage
$\frac{3}{4}$		
	0.35	
		12%
$\frac{3}{8}$		
	0.045	

Question 4

Question 4 – Percentages of amounts *(Section A · Skills practice)*

Work out each percentage. You may use 10% and 1% to help.

a. 10% of £80
b. 25% of 64 kg
c. 35% of £120
d. 7% of 250 m
e. 12.5% of 400

Question 5

Question 5 – Percentage increase and decrease *(Section A · Skills practice)*

Work out the new amount in each case.

a. Increase £60 by 10%.
b. Decrease £150 by 20%.
c. Increase 40 kg by 15%.
d. Decrease £84 by 25%.

Question 6

Question 6 – One quantity as a percentage of another *(Section A · Skills practice)*

Write the first quantity as a percentage of the second.

a. 18 out of 24
b. £7 out of £50
c. 45 cm out of 1.5 m
d. 350 g out of 2 kg

Question 7

Question 7 – The sale *(Section B · Real-life practice)*

In January, a sports shop has a sale. Trainers cost £65, a football costs £18 and a tracksuit costs £48. All items are reduced by 20%.

Item	Original price	Sale price
Trainers	£65	
Football	£18	
Tracksuit	£48	

a. Work out the sale price of each item.
b. Aisha buys all three items. How much does she spend and how much does she save?

c. Another shop sells the same trainers for £70 with 25% off. Which shop is cheaper for the trainers?
d. The first shop offers a further 10% off the sale price on Mondays. What is the Monday price of the tracksuit?

Question 8

Question 8 – Test results *(Section B · Real-life practice)*

Class 7A took a maths test. The table shows the marks for five pupils.

Pupil	Mark	Out of
Asha	36	40
Ben	27	30
Cara	45	60
Dev	17	20
Ella	70	80

a. Write each mark as a percentage.
b. Who did best?
c. The pass mark is 70%. Who passed?
d. Ella says: "If the test had been out of 100 I would have scored 87.5." Is she right?

Question 9

Question 9 – Saving with interest *(Section B · Real-life practice)*

Priya puts £200 in a savings account paying 3% simple interest each year. Her friend Max puts £250 in a different account paying 2% simple interest each year.

a. How much interest does Priya earn in 1 year?
b. How much interest does Max earn in 1 year?
c. How much does each have after 4 years?
d. After how many years does Priya have more than £230?

Question 10

Question 10 – Fitness tracker *(Section B · Real-life practice)*

A fitness tracker records the number of steps Tom takes each day. On Monday he took 8 500 steps. On Tuesday he took 12% more steps than on Monday. On Wednesday he took 15% fewer steps than on Tuesday.

a. How many steps did he take on Tuesday?
b. How many steps did he take on Wednesday?
c. What is the percentage change from Monday to Wednesday? Give your answer to 1 decimal place.

d. His daily target is 10 000 steps. Which days did he meet it?

Question 11

Question 11 – Recipe percentages *(Section B · Real-life practice)*

A 500 g cereal bar contains 45% oats, 20% nuts, 15% dried fruit and the rest is honey.

a. What percentage is honey?
b. How many grams of each ingredient are in the bar?
c. A second bar has 240 g of oats, which is 40% of the bar. What is its total mass?
d. Which bar has more oats, by mass, and how much more?

Question 12

Question 12 – Phone battery *(Section B · Real-life practice)*

Ellie's phone battery is at 85%. After one hour of gaming it has dropped by 18 percentage points. After an hour of music it drops by a further 12% of what it had at that moment.

a. What is the battery level after gaming?
b. What is the battery level after the music? Give your answer to the nearest whole percent.
c. Explain the difference between 18 percentage points and 18%.
d. A battery of 4 000 mAh is at 85%. How many mAh are left?

Question 13

Question 13 – The school canteen *(Section B · Real-life practice)*

The canteen sells 250 meals a day. 38% of pupils choose pizza, 24% choose pasta and 18% choose salad. The rest choose a sandwich.

a. What percentage choose a sandwich?
b. How many pupils choose each meal?
c. Next week 15% more pupils choose salad. How many pupils is that now?
d. A meal costs £2.40. How much money does the canteen make in 5 days?

Question 14

Question 14 – Buying a bike *(Section B · Real-life practice)*

A bike costs £320. The shop offers two deals. Deal A is 15% off. Deal B is a £40 reduction followed by a 5% discount.

a. Work out the price with deal A.
b. Work out the price with deal B.
c. Which deal is cheaper and by how much?

d. After buying the bike with the cheaper deal, a lock costs 12% of the bike price you paid. Work out the lock price.

Question 15

Question 15 – VAT and prices *(Section C · Problem solving)*

A laptop has a price of £480 before 20% VAT is added. A different shop shows a price of £560 including VAT.

a. Work out the price of the first laptop with VAT.
b. Work out the price of the second laptop before VAT was added.
c. Which laptop is cheaper including VAT, and by how much?
d. A student discount of 10% is applied to the price including VAT of the first laptop. What is the final price?

Question 16

Question 16 – Population change *(Section C · Problem solving)*

A town has 24 000 people. Over the next 3 years the population changes as shown.

Year	1	2	3
Change	+5%	+3%	-2%

a. Work out the population at the end of each year.
b. What is the total percentage change over the 3 years, to 1 decimal place?
c. A pupil says that the total change is 5% + 3% - 2% = 6%. Explain why this is incorrect.
d. How many more people are there after 3 years compared with the start?

Question 17

Question 17 – Discount comparisons *(Section C · Problem solving)*

Three shops sell the same jacket with different offers. The full price is £80.

Shop	Offer
A	25% off
B	1/3 off
C	£20 off

a. Work out the price in each shop.
b. Which shop is cheapest?
c. Shop A then has a further 10% off all sale prices. What is the new price in shop A?
d. Write the discount in shop C as a percentage of the full price.

Question 18

Question 18 – Spot the mistake *(Section C · Problem solving)*

Each pupil made one mistake. Find it and correct it.

a. Ali: 15% of 60 = 0.15 × 60 = 90.
b. Beth: 25% of £80 is £20, so a 25% increase gives £20.
c. Carl: 3.2 × 0.5 = 16.
d. Dina: a price drops from £50 to £40 so it fell by 40%.

Question 19

Question 19 – The investment *(Section C · Problem solving)*

Zoe invests £1 000 in an account paying 4% compound interest per year (the interest is added to the account each year and earns interest too).

Year	Start of year (£)	Interest (£)	End of year (£)
1	1 000		
2			
3			

a. Complete the table.
b. How much does she have after 3 years?
c. How much more is this than 3 years of simple interest at 4%?
d. After how many years does her money first exceed £1 200?

Question 20

Question 20 – Challenge: the fall and rise *(Section D · Challenge)*

The price of a game is reduced by 20% in a sale. After the sale the shop increases the reduced price by 20%.

a. The original price is £50. What is the final price?
b. Is the final price the same as the original? Explain.
c. What single percentage change would take the sale price back to the original price?
d. Show using algebra that increasing by 20% then decreasing by 20% gives a price 4% lower than the start.