[16-11-07-IP]

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Topic 4: Percentage

Part of a Whole as a Percentage

1. Fill in the blanks with the correct answers. The first one has been done for you.

   (a) If there are only 10 chairs in a room, then the 10 chairs make up the whole set of items in the room, represented by '100 %' (100 percent).

   If 2 chairs are occupied, then 2 out of the 10 chairs are occupied in the room.

   $$\text{or } \frac{2}{10} = \frac{20}{100} \text{ or } \left(\frac{2}{10} \times 100\%\right)$$

   $= 20\%$ of the chairs in the room are occupied.

   (b) If there are 15 fans in an office and 3 fans are not working, then

   $\frac{\square}{\square} = \square$ % of the fans in the office are working.

   (c) If I have \$250 in my savings account and I withdraw \$30 from it, then

   $\frac{\square}{\square} = \square$ % of the money in my savings account is left.

2. Fill in the blanks with suitable values.

   (a) ☐ out of 70 is 20%.

   (b) ☐ out of 260 is 30%.

   (c) ☐ out of 425 is 40%.

   (d) ☐ out of 195 is 60%.

   (e) 357 out of ☐ is 10%.

   (f) 65 out of ☐ is 5%.

   (g) 222 out of ☐ is 25%.

   (h) 90 out of ☐ is 75%.

   (i) 125 out of ☐ is 100%.

   (j) 450 out of ☐ is 50%.

(k) $\frac{3}{25}$ is equivalent to ☐ %

(l) $\frac{47}{50}$ is equivalent to ☐ %

(m) $\frac{13}{20}$ is equivalent to ☐ %

(n) $\frac{18}{40}$ is equivalent to ☐ %

(o) $1\frac{1}{4}$ is equivalent to ☐ %

(p) $3\frac{1}{2}$ is equivalent to ☐ %

(q) ☐ is equivalent to 210%

(r) ☐ is equivalent to 420%.

(s) ☐ is equivalent to 275%.

(t) ☐ is equivalent to 140%.

3. Fill in each blank with the correct value in the required unit.

(a) Andy went on a short vacation with \$600. He returned from the trip with \$90 left. What percentage of his money did he spend on the trip? _____%

(b) I spend 6 hours in a day sleeping. What percentage of the day do I use for other activities? _____%

(c) A reel of ribbon was 2 m long. After 48 cm was cut off from the reel, what percentage of the original reel was left? _____%

(d) A bottle contained $3\frac{1}{2}$ ℓ of juice when full. After 175 mℓ of juice was poured out from the bottle, what percentage of the bottle was still filled? _____%

(e) Out of 45 questions in a test paper, Lisa answered 36 correctly. What percentage of the questions did she answer wrongly if she attempted all the questions? _____%

(f) Last year, my school soccer team lost 5 games, won 9 games and tied in 1 game. What percentage of last year's games did the team not win? _____%

(g) Mabel sent 4 New Year cards to friends in Australia, 8 cards to England and 13 cards locally. What percentage of her cards were not sent locally? _____%

(h) Within a day, Leon spends 6 hours in school, 2 hours doing his homework, 1 hour watching television programs, 9 hours sleeping and the rest of the day on miscellaneous activities. What percentage of his day is spent on miscellaneous activities? _____%

(i) In a shop, a pair of shoes is priced at 60% of the price of a shirt. A shirt is priced at $45. How much must a customer pay altogether if he buys 1 shirt and 1 pair of shoes? $_____

(j) Out of 1700 people at a concert, 49% were females. How many more males than females were at the concert? _____more males

One Quantity as a Percentage of Another

4. Fill in the blanks with suitable values.

I am 24 years old, my mom is 50 years old and my grandma is 80 years old.

(a) My age is $\frac{24}{80} = \frac{\square}{\square} \times 100\%$

$= \square$ % of my grandma's age

(b) My grandma's age is $\frac{\square}{\square} \times 100\% = \square$ % of my mom's age.

(c) My grandma is $\frac{\square}{\square} \times 100\% = \square$ % older than my mom.

(d) I am $\square$ % younger than my mom.

5. Write the missing percentage values in the blanks provided.

(a) 42 g is _____% of 1.4 kg

(b) 12 min is _____% of 2 h

(c) 60 cm is _____% of 5 m

(d) 9 months is _____% of $1\frac{1}{2}$ years

(e) $\frac{3}{10}$ h is _____% of 120 min

(f) $\frac{1}{20}$ km is _____% of 2500 m

(g) $5\frac{1}{4}$ days is _____% of 1 week

(h) $4\frac{4}{5}$ hours is _____% of 1 day

(i) 1 m 2 cm is _____% of 85 cm

(j) 4888 m is _____% of 3 km 55 m

6. Work out the percentage increase or decrease for the following.

(a) 85 computers in a shop were sold yesterday.
Today, 68 such computers have been sold.

There is a _____% decrease in sale from yesterday.

(b) 75 books were borrowed from the school library last week.
This week, 93 books have been loaned out.

There is a _____% increase in the number of books borrowed this week.

(c) There were 665 parking lots at a shopping mall.
After expansion and upgrading, there are now 798 lots.

There are now _____% more parking lots than before.

(d) There is an intake of 4633 students in a university this year.

This is a/an _____% decrease compared to last year's enrollment of 5650.

(e) Mr. Richie borrowed \$25,500 from the bank to renovate his new house. He repaid the bank \$27,030 at the end of 1 year to settle his entire loan, including interest. The bank charged him a _____% interest on the loan.

(f) My dad paid \$1071 for a television set after he was given a discount of _____% off the original price of \$1260.

(g) Miss Smart estimates that she will need only 3 h 10 mins to complete a project if she does it using a computer, instead of 4 h 10 mins if she does it manually. In that case, _____% of her time will be saved by using the computer.

(h) After tidying up his room, my brother has enough space to put 56 books on his shelves, instead of 32 books before tidying up. He now has _____% more shelf space than before.

(i) 20 % of a class are boys and the rest are girls. There are _____% more girls than boys in the class.

(j) There were 75 % more adult passengers than children on a bus. After $\frac{1}{2}$ of the children had gotten off at a bus-stop, there were _____% more adults than children left on the bus.

WORD PROBLEMS

Part of a Whole as a Percentage

Guided Example:

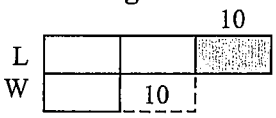
(a) The usual price of a blouse was \$36.
If Mother was offered a discount of 15% off the price, she only needed to pay

$$\square\% \text{ of the original price} = \frac{\square}{100} \times \$\square = \$\square$$

34. $682
35. 6 more marbles
36. 35 : 33
37. (a) 41 red apples (b) 41 : 35
38. 144 children
39. 100 cm
40. 44 new male members
41. 32 members
42. 500 eggs
43. 168 marbles
44. 26 beetles
45. 49 kg
46. 42 more male workers
47. $\frac{1}{4}$
48. 90 marbles

Take the Challenge!

1. (a)



Length = 30 cm
Width = 10 cm

(b) Length of shaded rectangle
$= \frac{3}{4}$ of a unit

Width of shaded rectangle
$= \frac{2}{3}$ of a unit

Area of shaded rectangle
$= \left(\frac{3}{4} \times \frac{2}{3}\right)$ square units
$= \frac{1}{2}$ square units
$= \frac{1}{2}$ of area of square

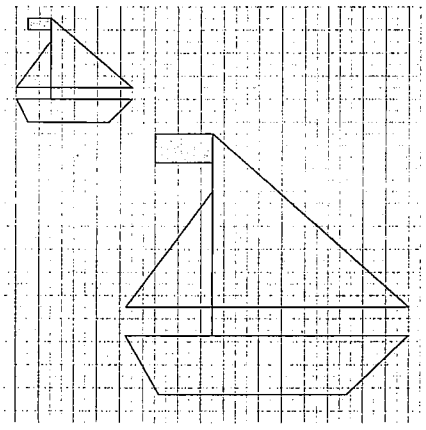
Ratio = 1 : 2

2.

	Marley	Molly
Salary	45	30
Spend	40	20 (= 2 : 1)
Left	5	10 (= 1 : 2)

(a) Marley spent $40.
(b) Molly has $10 left.

3.



Topic 4: Percentage

1. (b) $\frac{12}{15} = 80\%$ (c) $\frac{220}{250} = 88\%$
2. (a) 14 (b) 78
(c) 170 (d) 117
(e) 3570 (f) 1300
(g) 888 (h) 120
(i) 125 (j) 900
(k) 12 (l) 94
(m) 65 (n) 45
(o) 125 (p) 350
(q) $2\frac{1}{10}$ (r) $4\frac{1}{5}$
(s) $2\frac{3}{4}$ (t) $1\frac{2}{5}$
3. (a) 85 (b) 75
(c) 76 (d) 95
(e) 20 (f) 40
(g) 48 (h) 25
(i) 72 (j) 34
4. (a) $\frac{24}{80}$, 30 (b) $\frac{80}{50}$, 160
(c) $\frac{30}{50}$, 60 (d) 52
5. (a) 3 (b) 10
(c) 12 (d) 50
(e) 15 (f) 2
(g) 75 (h) 20
(i) 120 (j) 160
6. (a) 20 (b) 24 (c) 20
(d) 18 (e) 6 (f) 15
(g) 24 (h) 75 (i) 300
(j) 250

Word Problems

Guided Example:
(a) 85, 85, 36, 30.60
(b) 105, 105, 2500, 2625

1. 28%
2. 49%
3. 216 boys
4. (a) Paul (b) $8 more
5. 42%
6. (a) 483 men (b) 253 females
7. (a) $112,000 (b) $9500 more
8. (a) 8464 (b) 2064
9. 22 pieces
10. 64%
11. $196
12. $66
13. $520,000
14. $34
15. $540
16. $3150
17. $6480