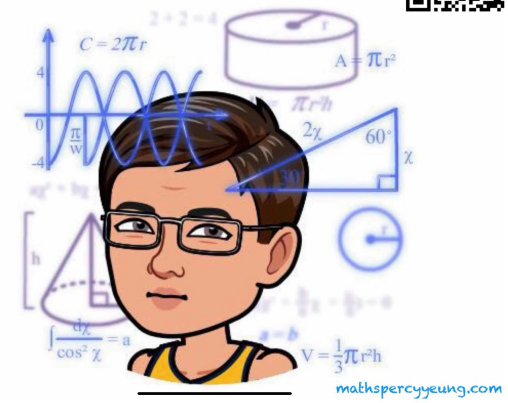

Ex 7A

7.1 Simple Problems on Percentages

1. Determine whether each of the following expressions is true (T) or false (F).

(a) $9\% = \frac{9}{10}$ _____

(b) $120\% = 0.12$ _____

(c) $0.3\% = 0.03$ _____

(d) $\frac{1}{4} = 25\%$ _____

(e) $0.0075 = 7.5\%$ _____

(f) $2.75 = 275\%$ _____

2. Find the unknown in each of the following.

(a) 30% of 75 is y.

(b) a% of 90 is 36.

(c) 15% of \$$x$ is \$225.

Solution

(a)

(b) ( ) × a% = ( )

(c)

3. Among 800 visitors in the library, 600 of them are students. What percentage of visitors are students?

Solution

4. A bottle contains 500 mL of water. Victor drinks 150 mL. What is the percentage of water left in the bottle?

Solution

Volume of water left in the bottle
= [( ) − ( )] mL
= ( ) mL

5. There are 320 songs in a playlist, 35% of which are in English. How many English songs are there in the playlist?

Solution

6. In a class of 40 students, 5% of them are absent. Find the number of students who are present.

Solution

7. There are 3500 members in an organization. 30% of them are under 18 years old. If 60% of the members under 18 years old are male, find the number of male members under 18 years old.

Solution

8. Terry spends \$20 000 to buy a second-hand car, which is 80% of his monthly salary. Find his monthly salary.

Solution

Let \$$x$ be Terry's monthly salary.

$x \times (\quad) = (\quad)$

$\therefore$ Terry's monthly salary is \$( ).

9. After running 15 km, Peter still has 40% of his journey to go. What is the total distance of his journey?

Solution

10. The ticket prices of a concert are \$100, \$200 and \$400 respectively. 22% of the tickets are \$100 tickets and 62% are \$400 tickets. If there are 2688 \$200 tickets, find

(a) the total number of tickets,

(b) the total number of \$200 and \$400 tickets.

Solution

(a)

(b)

11. In a test, the scores of Jessie and Mabel are 80 and 50 respectively.

(a) Find the percentage by which Jessie's score is higher than Mabel's score.

EYA **(b)** Mabel claims that her score is 60% lower than Jessie's score. Do you agree? Explain your answer.

Solution

(a)

(b)

12. In a book shop, 30% of the books are in English and the rest of them are in Chinese. It is known that the number of Chinese books is more than the number of English books by 2000.

(a) How many books are there in the book shop?

EYA **(b)** 2% of the Chinese books and 3% of the English books are travel books. The shop owner claims that his shop has at least 120 travel books. Do you agree? Explain your answer.

Solution

(a)

(b)

Ex7B

7.2 Percentage Change

1. Complete the following tables.

(a)

Original number	New number	Increase	Percentage increase
50	80		
280			45%
	165	40	

(b)

Original number	New number	Decrease	Percentage decrease
160	80		
	340	160	
225			20%

(c)

Original number	New number	Change	Percentage change
90	72		
240		60	
120			+35%

2. The price of a school bag is increased from \$160 to \$184.

(a) Find the increase in price.

(b) What is the percentage increase?

Solution

(a) Increase
$= \$[(\quad) - (\quad)]$
$= \underline{\underline{\$(\quad)}}$

(b) Percentage increase
$= \frac{(\quad)}{(\quad)} \times 100\%$
$= \underline{\underline{(\quad)}}$

3. The speed of the car is 72 km/h. If its speed is increased by 25%, what is

(a) the increase in the speed of the car?

(b) the new speed of the car?

Solution

(a)

(b)

4. In a city, there were 660 crimes in April and 627 crimes in May. Find the percentage decrease in the number of crimes from April to May.

Solution

5. The price of a pack of rice is \$164. If the price is decreased by 5%, find the new price.

Solution

6. The rent of a flat is increased by 40% and becomes \$12 180 this year. Find the rent last year.

Solution

7. The price of an *electrical appliance* is decreased by 10% each year. If the price of this electrical appliance is \$1800 now, find the price

(a) after one year,

(b) one year ago.

Solution

(a)

(b)

8. The number of visitors of a theme park was 5650 last month. Find the percentage change in the number of visitors if the number of visitors this month is

(a) 6328,

(b) 5198.

Solution

(a)

(b)

9. This year, there are 518 sheep in a farm, which is 42 less than the number of sheep last year. Find the percentage change in the number of sheep.

Solution

10. In the first examination, Joseph got 54 marks and 75 marks in English and Mathematics respectively. In the second examination, he got 67.5 marks and 93 marks in English and Mathematics respectively. In terms of percentage, which subject did Joseph have a greater improvement? Explain your answer.

Solution

11. Mr Chan saved \$12 000 last month and the amount he saves this month is increased by 5%. Mrs Chan saved \$8000 last month and the amount she saves this month is decreased by 10%.

(a) Find the total amount they save this month.

(b) Find the percentage change in the total amount they save.

Solution

(a)

(b)

Ex 7 C

7.3 Profit and Loss

1. Complete the following tables.

(a)

Cost price	Selling price	Profit	Profit per cent
$75		$22.5	
$270	$445.5		
	$156.4	$20.4	
$380			22%

(b)

Cost price	Selling price	Loss	Loss per cent
	$15.4	$4.6	
$182	$172.9		
	$975	$525	
$460			18%

2. A dress costing \$80 is sold at \$140. Find the profit per cent.

Solution

$$\text{Profit \%} = \frac{(\qquad)}{(\qquad)} \times 100\%$$
$$= (\qquad)$$

3. A pen costing \$5 is sold at a profit of 60%. Find

(a) the profit,

(b) the selling price.

Solution

(a)

(b)

4. The cost price of a pair of jeans is \$400. If it is sold at a profit of 15%, what is its selling price?

Solution

5. An electrical appliance company sells an air-conditioner for \$2880 at a profit of 80%.

(a) Find the cost price of the air-conditioner.

(b) Hence, find the profit.

Solution

(a) Let \$$x$ be the cost price of the air-conditioner.

$$x \times [1 + (\qquad)] = (\qquad)$$

$\therefore$ The cost price of the air-conditioner is \$( ).

(b)

6. James sold a tablet for \$2275 at a loss of \$1225.

(a) Find the cost price.

(b) Find the loss per cent.

Solution

(a)

(b)

7. Mr Chung bought a car for $260 000. Two years later, he sold it at a loss of 60%. Find the price at which Mr Chung sold the car.

Solution

8. Alan sells a mobile charger for $126 at a profit of 20%. Find the cost price of the mobile charger.

Solution

9. Simon bought 20 dozen eggs for $360. He then sold them all at $2.4 each. Find the profit per cent.

Solution

10. Stella bought a wallet for $400 and then sold it to Macy at a profit of $100. Macy then sold the wallet for $620. Whose profit per cent was larger? Explain your answer.

Solution

11. Kelvin sells a cushion for $54 at a profit of 20%.

(a) Find the cost price of the cushion.

(b) If Kelvin wants to make a profit of 40%, how much should he sell the cushion?

Solution

(a)

(b)

12. Mandy sold a smart watch to Peter at a profit of 8%. Later, Peter sold the smart watch to Kelly at a loss of 5%. If Kelly paid $3078 for the smart watch, find

(a) the amount Peter paid for the smart watch,

(b) the profit that Mandy made on the smart watch.

Solution

(a)

(b)

13. A sports goods company sells a tennis racket for $300 at a loss of 25%, and a sportswear for $660 at a profit of 20%. Find

(a) the cost price of the tennis racket,

(b) the cost price of the sportswear,

(c) the overall profit / loss per cent of selling 2 tennis rackets and 1 sportswear. (Give your answer correct to the nearest 1%.)

Solution

(a)

(b)

(c)

Ex 7D

7.4 Discount

1. Complete the following table.

Marked price	Selling price	Discount	Discount per cent
\$1250			8%
	\$128	\$32	
\$872		\$305.2	
\$565	\$497.2		
\$354			25%

2. The marked price of a vase is \$1140. If it is sold at a discount of 30%, what is the discount?

Solution

Discount = \$( ) × ( )

= \$( )

3. The marked price of a television is \$4200. If it is sold at a discount of 15%,

(a) what is the discount?

(b) what is the selling price?

Solution

(a)

(b)

4. A *blouse* marked \$125 is sold at \$105. Find the discount per cent.

Solution

Discount

$= \$[(\quad) - (\quad)]$

$= \$(\quad)$

Discount %

$= \dfrac{(\quad)}{(\quad)} \times 100\%$

$= (\quad)$

5. A pair of shoes is \$30 cheaper if it is sold at a discount of 12%. Find the marked price of the pair of shoes.

Solution

Let \$$p$ be the marked price of the pair of shoes.

$p \times (\quad) = (\quad)$

The marked price of the pair of shoes is \$( ).

6. Mrs Chan buys a ring at a discount of 25%. If the selling price of the ring is \$900, find the marked price.

Solution

7. In a shopping mall, a discount of 8% is given to customers who spend \$4000 or above. Mr Chan bought a laptop for \$4140.

(a) What is the marked price of the laptop?

(b) How much did Mr Chan save?

Solution

(a)

(b)

8. The marked prices of a toy plane and a toy car are \$164 and \$125 respectively. Terry buys the toy plane and the toy car at \$123 and \$90 respectively. Which toy is sold at a larger discount per cent? Explain your answer.

Solution

9. In shop *A*, the marked price of a watch is \$1280, and it is sold at a discount of 15%. In shop *B*, the marked price of the same watch is \$1150, and it is sold at a discount of \$100. Which shop offers a lower selling price for the watch? Explain your answer.

Solution

10. A box of printer ink is sold at 15% off and the discount is \$24.

(a) Find the marked price and the selling price.

(b) If the cost price of the box of printer ink is \$68, what is the profit per cent?

Solution

(a)

(b)

Integrated exercise 7

Conventional Questions

1. In a fitness club, there were 200 and 250 members in January and February respectively. The number of members in March is 8% less than that in February.

(a) Find the percentage increase in the number of members from January to February.

(b) Find the percentage change in the number of members from January to March.

Solution

(a)

(b)

2. Betty is 11% heavier than Annie and Annie is 10% lighter than Mary. It is given than the weight of Annie is 45 kg.

(a) Find the weight of Mary.

EYA **(b)** Among these three girls, who is the heaviest? Explain your answer.

Solution

(a)

(b)

3. The cost price of a watch is \$280. The watch is now sold and a profit of \$40 is made.

(a) Find the selling price of the watch.

(b) If the watch is sold at a discount of 20% on its marked price, find the marked price of the watch.

Solution

(a)

(b)

4. The length of the side of a square is 16 cm. If the length is decreased by 15%, find

(a) the length of the side of the new square,

(b) the percentage decrease in the perimeter.

Solution

(a)

(b)

5. A merchant buys 20 carpets for \$16 000. He sells the first 12 carpets at \$1000 each, and the remaining 8 carpets at \$600 each. Find

(a) the profit per cent of selling the first 12 carpets,

(b) the loss per cent of selling the remaining 8 carpets,

(c) the overall profit/loss per cent of selling all the carpets.

Solution

(a)

(b)

(c)

6. A flower shop owner bought some roses and *tulips*. The cost price of the roses was \$360 and they were sold at a profit of 15%. The tulips were sold for \$212 at a loss of 20%.

   (a) Find the selling price of the roses.

   (b) Find the cost price of the tulips.

   (c) The shop owner claimed that, overall, he had suffered a loss. Do you agree? Explain your answer.

Solution

(a)

(b)

(c)

7. In a department store's seasonal sale, all items are sold at a discount of 25%. If the total purchase after discount exceeds \$500, the customer will be offered an extra discount of 8% on the new selling price.

(a) Anthony wants to buy 2 items marked \$145 and \$215 respectively. How much does he have to pay?

(b) If Anthony buys an additional item marked \$350, the salesperson claims that the additional amount Anthony has to pay is less than \$220. Do you agree? Explain your answer.

Solution

(a)

(b)

8. A shop owner sets the marked price of a digital camera 30% above cost. Finally, he sells it at a discount of 10% and makes a profit of \$238. If the cost price of the digital camera is \$$x$,

(a) express the marked price of the digital camera in terms of x,

(b) express the selling price of the digital camera in terms of x,

(c) find the value of x.

Solution

(a)

(b)

(c)

Multiple Choice Questions

1. 60% of 95 is

   A. 0.57.

   B. 5.7.

   C. 57.

   D. 570. ☐

2. In a science club, 40% of the members are boys. If there are 144 girl members in the club, find the total number of members.

   A. 240

   B. 300

   C. 320

   D. 360 ☐

3. If Anna's score is 25% higher than Daisy's score, then Daisy's score is

   A. 20% lower than Anna's score.

   B. 25% lower than Anna's score.

   C. $33\frac{1}{3}\%$ lower than Anna's score.

   D. 75% lower than Anna's score. ☐

4. When x decreases by $a\%$, it is equal to y. $x =$

   A. $y + a\%$

   B. $\frac{y}{a\%}$

   C. $y\,(1 + a\%)$

   D. $\frac{y}{1 - a\%}$ ☐

5. In a forest, there were 1000 trees. The number of trees decreases by 15% in a fire. How many trees are left now?

   A. 150

   B. 750

   C. 850

   D. 1150 ☐

6. Compared with last month, Peter's weight is increased by 5%. If Peter's weight is increased by 3 kg this month, what is his weight this month?

   A. 57 kg

   B. 58 kg

   C. 60 kg

   D. 63 kg ☐

7. The price of a book is changed from \$80 to \$100. Then, the percentage change in the price is

   A. +20%.

   B. +25%.

   C. −20%.

   D. −25%. ☐

8. An umbrella costing \$30 is sold for \$50. What is the profit per cent?

   A. 20%

   B. $33\frac{1}{3}\%$

   C. 40%

   D. $66\frac{2}{3}\%$ ☐

9. A sandwich costing \$18 is sold at a loss of 15%. What is the selling price?

A. \$2.7 **C.** \$11.7

B. \$6.3 **D.** \$15.3 ☐

10. If a box of biscuits is sold at \$12, the loss per cent is 25%. Find the cost price.

A. \$14 **C.** \$20

B. \$16 **D.** \$24 ☐

11. Sam bought a drawing for \$1800. He then sold the drawing to Ken at a loss of 20%. At what price should Ken sell the drawing in order to make a profit of 20%?

A. \$2520

B. \$2160

C. \$1800

D. \$1728 ☐

12. Kary bought two hats at \$80 and \$120 respectively. She sold the first one at a profit of 20% and the second one at a loss of 10%. On the whole, she

A. makes a profit of 2%.

B. makes a profit of 10%.

C. suffers a loss of 2%.

D. suffers a loss of 10%. ☐

13. A box of puzzle marked \$80 is sold at \$68. Find the discount per cent.

A. 30%

B. 25%

C. 20%

D. 15% ☐

14. A cupboard marked \$1100 is sold at a discount of 15%. Find the selling price.

A. \$165

B. \$180

C. \$935

D. \$1050 ☐

15. A suit is \$171 cheaper if it is sold at a discount of 18%. Find the marked price.

A. \$550

B. \$750

C. \$950

D. \$1150 ☐

16. The marked prices of a handbag and a shirt are \$250 and \$90 respectively. Sally buys the handbag and the shirt at discounts of 15% and 20% respectively. How much does she save in total?

A. \$19.5

B. \$44

C. \$55.5

D. \$71 ☐

17. Jacky bought a hi-fi at a discount of 10% on its marked price. He then sold it to Tom for \$3780. If Jacky made a profit of 20%, find the marked price of the hi-fi.

A. \$2835

B. \$3150

C. \$3465

D. \$3500 ☐