

Year 7 Term 1 Test Answers

Student Name: _____	Grade: _____
Date: _____	Score: _____

- Answer the questions in the spaces provided on the question sheets.
- If you run out of room for an answer, continue on the back of the page.
- This test has 20 questions, for a total of 100 marks.
- Attempt all 20 questions.
- Time allowed: 40 minutes.

Page:	1	2	3	4	Total
Points:	35	21	26	18	100
Score:					

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11 Year 7 Term 1 Test Answers

11.1 Quiz 1

1. Twice a number plus six is the same as six times the number minus sixteen. Find that number. [5]

Solution: $2N + 6 = 6N - 16, \Rightarrow 22 = 4N, \Rightarrow N = \frac{22}{4} = 5\frac{1}{2}, \text{ or } 5.5$

2. Calculate the quotient of the 8th and 3rd triangular numbers. [5]

Solution: $1, 3, 6, 10, 15, 21, 28, 36, \dots \Rightarrow 36 \div 6 = 6.$

3. Find the LCM of 12, 16 and 24. [5]

Solution: $LCM(12, 16, 24) = 48.$

4. Peter is 24 years older than David. In 12 years time, their total age will be 88 years. Find their present ages. [5]

Solution:
$$\begin{cases} P = D + 24 \\ (D + 12) + (P + 12) = 88 \end{cases} \Rightarrow D = 20 \text{ and } P = 20 + 24 = 44.$$

5. Solve the following equation $-5(3x + 2) = -40$ [5]

Solution: $-15x - 10 = -40, \Rightarrow -15x = -30, \Rightarrow x = 2.$

6. Find the HCF of 216 and 324 [5]

Solution: $216 = 2^3 \times 3^3, 324 = 2^2 \times 3^4, \Rightarrow HCF(216, 324) = 2^2 \times 3^3 = 108.$

7. Find the largest odd factor of 74. [5]

Solution: $72 \div 2 = 37.$

8. Find the value of $\sqrt{2704}$ if $2704 = 2^4 \times 13^2$ [5]

Solution: $\sqrt{2704} = \sqrt{2^4} \times \sqrt{13^2} = 4 \times 13 = 52.$

9. Evaluate the following:

(a) $\sqrt{2^4 \times 3^2}$ [2]

Solution: $\sqrt{2^4} \times \sqrt{3^2} = 4 \times 3 = 12.$

(b) $\sqrt{49} \times \sqrt[3]{1000} \div \sqrt{25}$ [2]

Solution: $\sqrt{7^2} \times \sqrt[3]{10^3} \div \sqrt{5^2} = 7 \times 10 \div 5 = 14.$

(c) $\sqrt{16 \times 9} + \sqrt{16} \times \sqrt{9}$ [2]

Solution: $\sqrt{16} \times \sqrt{9} + \sqrt{16} \times \sqrt{9} = 4 \times 4 + 4 \times 2 = 24.$

10. Alice spent \$280 on food and $\frac{2}{5}$ of the remainder on transport. She had \$120 left. How much money did she have at first? [5]

Solution: Spent \$280, $\Rightarrow \frac{3}{5}$ of the Remain = \$120, \Rightarrow Remain = $120 \times \frac{5}{3} = 200.$
Total money at first = \$280 + 200 = \$480.

11. The cost of a pen is 65% the cost of a book. The book costs \$21 more than the pen. Find the cost of the book. [5]

Solution:
$$\begin{cases} P = 0.65B \\ B = P + 21 \end{cases} \Rightarrow B = 0.65B + 21 \Rightarrow B = \$60.$$

12. If $441 = 3 \times 3 \times 7 \times 7$ and $1134 = 2 \times 3 \times 3 \times 3 \times 3 \times 7$, what is the HCF (441, 1134)? [5]

Solution: $441 = 3^2 \times 7^2$; $1134 = 2 \times 3^4 \times 7$, $\Rightarrow HCF(441, 1134) = 3^2 \times 7 = 63$.

13. Evaluate the following:

- (a) How many years are there from AD 502 to AD 2008? [2]

(a) $2008 - 502 = 1506$ year.

- (b) How many years are there from 500 BC to 208 BC? [2]

(b) $500 - 208 = 292$ years.

- (c) How many years are there from 108 BC to AD 208? [2]

(c) $108 + 208 - 1 = 315$ years.

14. How many days are there from 1 March to 30 June? [5]

Solution: $30 + 30 + 31 + 30 = 121$ days.

15. Rebecca needs to see her doctor every fortnight. If her last visit was on 22 July, What will be the dates of her next two appointments? [5]

Solution: 5, August and 19 August.

16. In winter, when it is noon in Sydney it is 11:30 am in Adelaide and 10 am in Perth. What time is it in Adelaide when it is 9:15 pm in Sydney? [5]

Solution: Perth 10:00 a.m; Adelaide 11:30; Sydney 12:00 a.m. $\Rightarrow 9 : 15 - 0 : 30 = 8 : 45$ p.m.

17. Evaluate the following:

(a) $5 \text{ h } 43 \text{ min} + 2 \text{ h } 34 \text{ min}$

[2]

(a) 8 hrs 17 min.

(b) $12 \text{ h } 8 \text{ min} - 8 \text{ h } 12 \text{ min}$

[2]

(b) 3 hrs 56 min.

18. Use your calculator to convert the following:

(a) $15 \text{ h } 15 \text{ min } 15 \text{ s}$ to seconds

[2]

(a) 54915 sec

(b) 3836 s to hours, minutes and seconds

[2]

(b) 1 hr 3 min 56 sec

19. An aeroplane leaves Brisbane at 12:20 pm flying to Adelaide. If the flight takes 115 minutes, at what time does it arrive in Adelaide? [5]

Solution:

$$12 : 20 + 1 : 55 = 2 : 15, \Rightarrow 2 : 15 - 0 : 30 = 1 : 45 \text{ p.m.}$$

20. There are 1000 apples and oranges at a fruit stall. $\frac{1}{3}$ of the apples is equal to $\frac{1}{5}$ of the oranges. How many more oranges than apples? [5]

Solution:

$$A : O = 3 : 5, \Rightarrow 1000 \div 8 = 125, \Rightarrow 2 \times 125 = 250 \text{ more.}$$

11.3 Miscellaneous Exercise

Exercise 11.3.1

1. A ball is dropped from a height of 280 cm. At each bounce it comes up to half the height which it fell. If it is caught at the top point of a bounce of 35 cm, what distance has the ball travelled altogether?

Solution: $280 + 140 + 140 + 70 + 70 + 35 = 735 \text{ cm}$

2. Ray and Josh decide to go rowing on the river to a spot 16 km away. They row 4 km in half a hour, then they rest in the rowboat for 10 minutes. During the time they were resting the current drags them back 1 km. This pattern is repeated until they reach their destination. Calculate how long it will take the boys to reach:

- (a) a point 10 km from where they start;

Solution: $30 \times 3 + 10 \times 2 = 110 \text{ min} \Rightarrow 1 \text{ hr } 50 \text{ min}$

- (b) their destination.

Solution: $30 \times 5 + 10 \times 4 = 190 \text{ min} \Rightarrow 3 \text{ hrs } 10 \text{ min}$

3. Express each of the following as a simple fraction in lowest terms:

(a) $1 \div (1 \div \frac{1}{2}) = 1 \div 2 = \frac{1}{2}$

(b) $1 \div (1 \div \frac{2}{3}) = 1 \div \frac{3}{2} = \frac{2}{3}$

(c) $\frac{1}{2 + \frac{1}{2}}$

Solution: $\frac{1}{2 + \frac{1}{2}} = \frac{1}{2\frac{1}{2}} = \frac{1}{\frac{5}{2}} = \frac{2}{5}$

(d) $\frac{1}{1 + \frac{1}{1 - \frac{1}{2}}}$

Solution: $\frac{1}{1 + \frac{1}{1 - \frac{1}{2}}} = \frac{1}{1 + \frac{1}{1+2}} = \frac{1}{1+2} = \frac{1}{3}$

Exercise 11.3.2

1. David buys a toy car. He later sells it to Joe and loses \$3.00 on the deal. Joe makes a profit of \$6 by selling it to Ben for \$24. How much did David pay for the toy car?

Solution:

$$\text{David paid } \$24 - 6 + 3 = \$21.$$

2. Alice is twice as old as Betty. Cathy is 5 years younger than Alice. The sum of the ages of the three girls is 25. How old is Betty?

Solution:

$$\begin{cases} A = 2B \\ C = A - 5 \\ A + B + C \end{cases} \Rightarrow B = 6; A = 12 \text{ and } C = 7.$$

3. A rectangle has a perimeter of 84 cm. The length of the rectangle is 22 cm more than its width. Find the area of the rectangle.

Solution: 242mm]

$$\begin{aligned} P &= (W + W + 22) \times 2 \Rightarrow W = 10 \\ A &= 10 \times 32 = 320 \text{ cm}^2. \end{aligned}$$

4. In a group of 28 boys, 12 joined the athletics team, 15 joined the maths team, and 8 joined both teams. How many of the boys did not join either team?

Solution:

$$4 + 8 + 7 = 19 \Rightarrow 28 - 19 = 9, \text{ there is 9 of them did not join either term.}$$

5. The average of a group of 40 numbers is 40. The average of a different group of 60 numbers is 60. The two groups of numbers are combined into a single group. What is the average of the combined group?

Solution:

$$(40 \times 40 + 60 \times 60) \div 100 = 5200 \div 100 = 52.$$

Exercise 11.3.3 Rate and Ratio

1. Anna can type 80 words per minute. At this rate, how long will she take to type a document of 36 pages if the average number of words on each page is 300?

Solution: $300 \times 36 = 10800 \Rightarrow 10800 \div 80 = 135 \text{ min, or } 2 \text{ hrs } 15 \text{ min}$

2. Bonnie can sew 17 shirts in 3 days. At this way, how much will she earn in 27 days if she is paid \$12 for each shirt she sews?

Solution: $17 : 3 = x : 27, \Rightarrow x = 153 \Rightarrow \$12 \times 153 = \$1836.$

3. A pool can be filled in one hour by 6 taps flowing at the same rate. How long will it take for 4 such taps to fill the same pool?

Solution: $6 \times 60 = 360 \Rightarrow 360 \div 4 = 90 \text{ min or } 1 \text{ hr } 30 \text{ min.}$

4. 8 technicians working at the same rate can complete a project in two hours. How long will it take 5 technicians to complete the same project?

Solution: $8 \times 2 = 16, \Rightarrow 16 \div 5 = 3.2 \text{ hrs or } 3 \text{ hrs } 12 \text{ min}$

5. Ken can plant 14 trees in 5 hours. At this rate, how much will he earn in 5 weeks (five working days a week), if he works 8 hours each day and is paid \$5 for each tree he plants?

Solution:

$5 \text{ weeks} = 5 \times 5 \times 8 = 200 \text{ hours.}$

$14 : 5 = x : 200 \Rightarrow x = 560 \text{ trees}$

$\text{Total earning} = 5 \times 560 = \$2800.$

Exercise 11.3.4 Speed and Rate

1. A driver uses 4.5 litres of petrol for every 50 km when his average driving speed is 80 km/h. He uses 5 litres of petrol for every 60 km he drives when his average driving speed is 50 km/h. How much petrol will he use for a journey which lasts 10 hours if he travels at 80 km/h for 4 hours and 50 km/h for the rest of the journey?

Solution:

$$d_1 = 4 \times 80 = 320 \text{ km}, \quad d_2 = 6 \times 50 = 900 \text{ km}$$

$$(320 \div 50) \times 4.5 + (300 \div 60) \times 5 = 53.8 \text{ L.}$$

2. Lee and Emma left town A together and drove towards Town B which was 84 km away. Lee was travelling at 60 km/h Emma's speed was 20 km/h faster than Lee's. After travelling $\frac{2}{7}$ of the journey, Emma took a rest until Lee caught up with her. How long did Emma rest?

Solution:

$$24 \text{ km} \div 80 \text{ km/h} = 18 \text{ min} \quad 24 \text{ km} \div 60 \text{ km/h} = 24 \text{ min}$$

$$24 - 18 = 6 \text{ min.}$$

3. Mary drove from Town A to Town B which was 480 km away. For the first 270 km, she drove at an average speed of 90 km/h. she then increased her speed by 15 km/h and completed the rest of her journey. What was her average speed for the whole journey?

Solution:

$$\text{Total distance} = 480 \text{ km}; \quad D_1 = 270 \text{ km}; \quad \Rightarrow \quad d_2 = 480 - 270 = 210 \text{ km.}$$

$$t_1 = 270 \div 90 = 3 \text{ hrs}; \quad t_2 = 210 \div (90 + 15) = 2 \text{ hrs.}$$

$$\Rightarrow T = t_1 + t_2 = 3 + 2 = 5 \text{ hrs.}$$

$$\therefore \text{Average speed} = 480 \div 5 = 96 \text{ km/h.}$$

4. Tony took 20 min to drive from his home to his office in the morning. In the evening, he took one hour to walk the same distance home. The difference between his driving and walking speed is 36 km/h. How far was Tony's home from his office?

Solution:

$$\text{Let the driving speed be } S \Rightarrow D = S \times \frac{1}{3} = (S - 36) \times 1$$

$$S = 3S - 108, \Rightarrow S = 54 \text{ km/h}, \Rightarrow D = 54 \times \frac{1}{3} = 18 \text{ km.}$$