REVISION TEST 1 (Page 22)

This Revision Test covers the material contained in chapters 1 and 2. *The marks available are*

shown at the end of each question.

1. Evaluate: 1009 cm - 356 cm - 742 cm + 94 cm

	Marks
1009 + 94 = 1103	1
356 + 742 = 1098	1
1009 cm - 356 cm - 742 cm + 94 cm = 1103 cm – 1098 cm	
= **5 cm**	1
Total:	**3**

2. Determine £284 × 9

	Marks
284 9 2556 7 3	2
Hence, £284 × 9 = **£2556**	1
Total:	**3**

3. Evaluate: (a) - 11239 - (- 4732) + 9639   (b) - 164 × - 12   (c) 367 × - 19

	Marks
(a) - 11239 - (- 4732) + 9639 = - 11239 + 4732 + 9639 = **3132**	3
(b) - 164 × - 12 = 164 × 12 = **1968**	3
(c) 367 × - 19 = **- 6973**	2
Total:	**8**

1

4. Calculate: (a) $153 ÷ 9$ (b) $1397 \text{ g} ÷ 11$

	Marks
(a) $153 ÷ 9 = $**$17**	3
(b) $1397 \text{ g} ÷ 11 = $ **127 g**	3
Total:	**6**

5. A small component has a mass of 27 grams. Calculate the mass, in kilograms, of 750 such components.

	Marks
Mass of 750 components $= 750 × 27 \text{ g} = 20{,}250 \text{ g}$	2
$= $ **20.25 kg**	1
Total:	**3**

6. Find (a) the highest common factor, and (b) the lowest common multiple of the following numbers: 15   40   75   120

	Marks
The factors of the given numbers are:	
$\quad 15 = 3 × 5$	1
$\quad 40 = 2 × 2 × 2 × 5$	1
$\quad 75 = 3 × 5 × 5$	1
$\quad 120 = 2 × 2 × 2 × 3 × 5$	1
(a) H.C.F. $= $ **5**	1
(b) L.C.M. $= 2 × 2 × 2 × 3 × 5 × 5 = $ **600**	2
Total:	**7**

7. Evaluate: $7 + 20 \div (9 - 5)$

	Marks
$7 + 20 \div (9 - 5) = 7 + 20 \div 4 \qquad$ (B)	1
$= 7 + 5 \qquad$ (D)	1
$= \mathbf{12} \qquad$ (A)	1
Total:	3

8. Evaluate: $147 - 21(24 \div 3) + 31$

	Marks
$147 - 21(24 \div 3) + 31 = 147 - 21 \times 8 + 31 \qquad$ (B)	1
$= 147 - 168 + 31 \qquad$ (M)	1
$= \mathbf{10} \qquad$ (A/S)	1
Total:	3

9. Evaluate: $40 \div (1 + 4) + 7[8 + (3 \times 8) - 27]$

	Marks
$40 \div (1 + 4) + 7[8 + (3 \times 8) - 27] = 40 \div (1 + 4) + 7[8 + 24 - 27] \qquad$ (B)	1
$= 40 \div 5 + 7 \times 5 \qquad$ (B)	1
$= 8 + 7 \times 5 \qquad$ (D)	1
$= 8 + 35 \qquad$ (M)	1
$= \mathbf{43} \qquad$ (A)	1
Total:	5

10. Evaluate: $\dfrac{(7-3)(2-5)}{3(9-5)\div(2-6)}$

	Marks
$\dfrac{(7-3)(2-5)}{3(9-5)\div(2-6)} = \dfrac{4\times-3}{3\times4\div-4}$	2
$= \dfrac{-12}{-3} = \mathbf{4}$	2
Total:	**4**

11. Evaluate: $\dfrac{(7+4\times5)\div3+6\div2}{2\times4+(5-8)-2^2+3}$

	Marks
$\dfrac{(7+4\times5)\div3+6\div2}{2\times4+(5-8)-2^2+3} = \dfrac{27\div3+6\div2}{2\times4+-3-2^2+3}$	2
$= \dfrac{9+6\div2}{2\times4+-3-4+3} = \dfrac{9+3}{8-3-4+3}$	2
$= \dfrac{12}{4} = \mathbf{3}$	1
Total:	**5**

12. Evaluate: $\dfrac{(4^2\times5-8)\div3+9\times8}{4\times3^2-20\div5}$

	Marks
$\dfrac{(4^2\times5-8)\div3+9\times8}{4\times3^2-20\div5} = \dfrac{72\div3+9\times8}{4\times9-20\div5} = \dfrac{24+9\times8}{36-4}$	3
$= \dfrac{24+72}{32} = \dfrac{96}{32} = \mathbf{3}$	2
Total:	**5**

13. Simplify: (a) $\dfrac{3}{4} - \dfrac{7}{15}$ (b) $1\dfrac{5}{8} - 2\dfrac{1}{3} + 3\dfrac{5}{6}$

	Marks
(a) $\dfrac{3}{4} - \dfrac{7}{15} = \dfrac{45 - 28}{60} = \dfrac{\mathbf{17}}{\mathbf{60}}$	2
(b) $1\dfrac{5}{8} - 2\dfrac{1}{3} + 3\dfrac{5}{6} = 1 + \dfrac{5}{8} - 2 - \dfrac{1}{3} + 3 + \dfrac{5}{6} = 2 + \dfrac{5}{8} - \dfrac{1}{3} + \dfrac{5}{6}$	2
$= 2 + \dfrac{15 - 8 + 20}{24}$	1
$= 2 + \dfrac{27}{24} = 2 + 1 + \dfrac{3}{24}$	2
$= \mathbf{3\dfrac{1}{8}}$	1
Total:	**8**

14. A training college has 375 students of which 120 are girls. Express this as a fraction in its simplest form.

	Marks
Fraction of girls $= \dfrac{120}{375} = \dfrac{24}{75} = \dfrac{\mathbf{8}}{\mathbf{25}}$	2
Total:	**2**

15. A tank contains 30,000 litres of oil. Initially, $\dfrac{7}{10}$ of the contents are removed, then $\dfrac{4}{9}$ of the remainder is removed. How much oil is left in the tank?

	Marks

		Marks
Oil initially removed = $\dfrac{7}{10} \times 30000 = 21000$ litres		2
Hence, oil remaining = $30000 - 21000 = 9000$ litres		
Amount now removed = $\dfrac{4}{9} \times 9000 = 4000$ litres		2
		4
Hence, **oil remaining** = $9000 - 4000 =$ **5000 litres** (or similar)		
	Total:	

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16. Evaluate: (a) $1\dfrac{7}{9} \times \dfrac{3}{8} \times 3\dfrac{3}{5}$ (b) $6\dfrac{2}{3} \div 1\dfrac{1}{3}$ (c) $1\dfrac{1}{3} \times 2\dfrac{1}{5} \div \dfrac{2}{5}$

	Marks
(a) $1\dfrac{7}{9} \times \dfrac{3}{8} \times 3\dfrac{3}{5} = \dfrac{16}{9} \times \dfrac{3}{8} \times \dfrac{18}{5} = \dfrac{2}{3} \times \dfrac{1}{1} \times \dfrac{18}{5} = \dfrac{2}{1} \times \dfrac{1}{1} \times \dfrac{6}{5} = \dfrac{12}{5} = \mathbf{2\dfrac{2}{5}}$	3
(b) $6\dfrac{2}{3} \div 1\dfrac{1}{3} = \dfrac{20}{3} \div \dfrac{4}{3} = \dfrac{20}{3} \times \dfrac{3}{4} = \dfrac{5}{1} \times \dfrac{1}{1} = \mathbf{5}$	3
(c) $1\dfrac{1}{3} \times 2\dfrac{1}{5} \div \dfrac{2}{5} = \dfrac{4}{3} \times \dfrac{11}{5} \div \dfrac{2}{5} = \dfrac{4}{3} \times \dfrac{11}{5} \times \dfrac{5}{2} = \dfrac{2}{3} \times \dfrac{11}{1} \times \dfrac{1}{1} = \dfrac{22}{3} = \mathbf{7\dfrac{1}{3}}$	4
Total:	**10**

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17. Calculate: (a) $\dfrac{1}{4} \times \dfrac{2}{5} - \dfrac{1}{5} \div \dfrac{2}{3} + \dfrac{4}{15}$ (b) $\dfrac{\dfrac{2}{3} + 3\dfrac{1}{5} \times 2\dfrac{1}{2} + 1\dfrac{1}{3}}{8\dfrac{1}{3} \div 3\dfrac{1}{3}}$

	Marks
(a) $\dfrac{1}{4} \times \dfrac{2}{5} - \dfrac{1}{5} \div \dfrac{2}{3} + \dfrac{4}{15} = \dfrac{1}{4} \times \dfrac{2}{5} - \dfrac{1}{5} \times \dfrac{3}{2} + \dfrac{4}{15} = \dfrac{1}{10} - \dfrac{3}{10} + \dfrac{4}{15} = \dfrac{3-9+8}{30} = \dfrac{2}{30} = \mathbf{\dfrac{1}{15}}$	4
(b) $\dfrac{\dfrac{2}{3} + 3\dfrac{1}{5} \times 2\dfrac{1}{2} + 1\dfrac{1}{3}}{8\dfrac{1}{3} \div 3\dfrac{1}{3}} = \dfrac{\dfrac{2}{3} + \dfrac{16}{5} \times \dfrac{5}{2} + \dfrac{4}{3}}{\dfrac{25}{3} \div \dfrac{10}{3}} = \dfrac{\dfrac{2}{3} + 8 + \dfrac{4}{3}}{\dfrac{25}{3} \times \dfrac{3}{10}} = \dfrac{10}{2.5} = \mathbf{4}$	4
Total:	**8**

18. Simplify: $\left\{\dfrac{1}{13}\text{ of }\left(2\dfrac{9}{10}-1\dfrac{3}{5}\right)\right\}+\left(2\dfrac{1}{3}\div\dfrac{2}{3}\right)-\dfrac{3}{4}$

	Marks
$\left\{\dfrac{1}{13}\text{ of }\left(2\dfrac{9}{10}-1\dfrac{3}{5}\right)\right\}+\left(2\dfrac{1}{3}\div\dfrac{2}{3}\right)-\dfrac{3}{4}=\dfrac{1}{13}\times\left(\dfrac{29}{10}-\dfrac{8}{5}\right)+\left(\dfrac{7}{3}\times\dfrac{3}{2}\right)-\dfrac{3}{4}$	2
$=\dfrac{1}{13}\times\left(\dfrac{29-16}{10}\right)+\left(\dfrac{7}{2}\right)-\dfrac{3}{4}$	2
$=\dfrac{1}{13}\times\dfrac{13}{10}+\dfrac{7}{2}-\dfrac{3}{4}$	1
$=\dfrac{1}{10}+\dfrac{7}{2}-\dfrac{3}{4}=\dfrac{2+70-15}{20}=\dfrac{57}{20}=\mathbf{2\dfrac{17}{20}}$	3
Total:	**8**

19. Convert 0.048 to a proper fraction.

	Marks
$\mathbf{0.048}=\dfrac{48}{1000}=\dfrac{12}{250}=\dfrac{\mathbf{6}}{\mathbf{125}}$	2
Total:	**2**

20. Convert 6.4375 to a mixed number.

	Marks
$0.4375=\dfrac{4375}{10000}=\dfrac{175}{400}=\dfrac{7}{16}$	2
Hence, $\qquad\mathbf{6.4375}=\mathbf{6\dfrac{7}{16}}$	1
Total:	**3**

21. Express $\dfrac{9}{32}$ as a decimal fraction.

		Marks
$$32\overline{)9.0000}^{\displaystyle 0.28125}$$		
i.e. $\dfrac{9}{32} = \mathbf{0.28125}$		2
	Total:	**2**

22. Express 0.0784 correct to 2 decimal places.

		Marks
0.0784 = **0.08**, correct to 2 decimal places.		2
	Total:	**2**

23. Express 0.0572953 correct to 4 significant figures.

		Marks
0.0572953 = **0.05730**, correct to 4 significant figures.		2
	Total:	**2**

24. Evaluate: (a) $46.7 + 2.085 + 6.4 + 0.07$ (b) $68.51 – 136.34$

		Marks
(a) $46.7 + 2.085 + 6.4 + 0.07 = \mathbf{55.255}$		2
(b) $68.51 – 136.34 = \mathbf{-\ 67.83}$		2
	Total:	**4**

25. Determine 2.37×1.2

	Marks
$\begin{array}{r} 237 \\ \underline{12} \\ \underline{2844} \end{array}$	2
Hence, **2.37 × 1.2** = **2.844**	1
Total:	**3**

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26. Evaluate $250.46 \div 1.1$, correct to 1 decimal place.

	Marks
$\begin{array}{r} 227.69 \\ 11\overline{)2504.60} \end{array}$	2
Hence, **250.46 ÷ 1.1** = **227.7**, correct to 1 decimal place.	1
Total:	**3**

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27. Evaluate $5.2\dot{}\times 15$

	Marks
$5.\dot{2} \times 15 = 5.22222222 \times 15 = 78.3333333 = \mathbf{78.\dot{3}}$	2
Total:	**2**

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28. Express 56.25% as a fraction in its simplest form.

	Marks
$56.25\% = \dfrac{56.25}{100} = \dfrac{5625}{10000} = \dfrac{225}{400} = \mathbf{\dfrac{9}{16}}$	3
Total:	**3**

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29. 12.5% of a length of wood is 70 cm. What is the full length?

	Marks
If 12.5% of a length of wood is 70 cm, then 1% = $\dfrac{70}{12.5}$	1
and **full length**, i.e. 100% = $\dfrac{70}{12.5} \times 100$ = **560 cm** or **5.60 m**	2
Total:	**3**

30. A metal rod, 1.20 m long, is heated and its length expands by 42 mm. Calculate the percentage increase in length.

	Marks
Percentage increase in length = $\dfrac{42}{1.20 \times 10^{3}} \times 100\%$ = **3.5%**	2
Total:	**2**

31. In a box of 2000 nails, 120 are defective. Express the non-defective nails as a ratio of the defective ones, in its simplest form.

	Marks
Defective nails = 120; Non-defective nails = 2000 – 120 = 1880	1
Ratio of non-defective : defective is 1880:120	1
= 376:24	
= **47:3** in its simplest form.	1
Total:	**3**

32. Prize money in a lottery totals £3801 and is shared among three winners in the ratio 4:2:1. How much does the first prize winner receive?

	Marks
Total number of shares = 4 + 2 + 1 = 7	1
Hence, each share = $\dfrac{£3801}{7}$ = £543	1
First prize winner = 4 shares = 4 × £543 = **£2172**	1
Total:	**3**

33. A simple machine has an effort : load ratio of 3:37. Determine the effort, in Newtons, to lift a load of 5.55 kN.

	Marks
Effort = $\dfrac{3}{37} \times 5.55\,\text{kN}$ = 0.45 kN	2
= **450 N**	1
Total:	**3**

34. If 16 cans of lager weigh 8.32 kg, what will 28 cans weigh?

	Marks
If 16 cans of lager weigh 8.32 kg, 1 can weighs $\dfrac{8.32}{16}$ kg	1
and **28 cans weigh** $28 \times \dfrac{8.32}{16}$ kg = **14.56 kg**	2
Total:	**3**

35. Hooke's law states that stress is directly proportional to strain within the elastic limit of a material. When for brass the stress is 21 MPa, the strain is 250×10^{-6}. Determine the stress when the strain is 350×10^{-6}.

	Marks

	Marks
When strain is 350×10^{-6}, **stress** $= \dfrac{350 \times 10^{-6}}{250 \times 10^{-6}} \times 21\,\text{MPa} = \textbf{29.4 MPa}$	4
Total:	4

36. If 12 inches = 30.48 cm, find the number of millimetres in 23 inches.

	Marks
12 inches = 30.48 cm = 304.8 mm	
from which, 1 inch $= \dfrac{304.8}{12}$ mm	1
and **23 inches** $= \dfrac{304.8}{12} \times 23$ mm $= \textbf{584.2 mm}$	2
Total:	3

37. If x is inversely proportional to y and x = 12 when y = 0.4, determine:

(a) the value of x when y is 3, and (b) the value of y when x = 2

	Marks
$x \; \alpha \; \dfrac{1}{y}$ or $x = \dfrac{k}{y}$ or $k = xy = (12)(0.4) = 4.8$	1
(a) When y = 3, $\mathbf{x} = \dfrac{k}{y} = \dfrac{4.8}{3} = \textbf{1.6}$	2
(b) When x = 2, $\mathbf{y} = \dfrac{k}{x} = \dfrac{4.8}{2} = \textbf{2.4}$	2
Total:	5

TOTAL MARKS FOR REVISION TEST 1: 150