Name:

Exam Style Questions

Ratio: Equations

Corbettmaths

Equipment needed: Pen and Calculator

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Video Tutorial

www.corbettmaths.com/contents

Video 271d

Answers and Video Solutions

1. $x : y = 5 : 1$

Circle the correct equation.

$y = 5x$ $x = 5y$ $x = 6y$ $y = 6x$

(1)

2. $c : d = 1 : 2$

Circle the correct equation.

$c = 3d$ $d = 3c$ $c = 2d$ $d = 2c$

(1)

3. $y = 3x$

Write down the ratio $x : y$

1 : 3

(1)

4. x is eight times y

$x = 8y$

Work out the ratio $y : x$

1 : 8

(1)

5. x is a quarter of y

Work out the ratio $x : y$

1 : 4

.....

(1)

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6. In a furniture shop, the ratio of tables to chairs is 8 : 8

Circle the formula that connects the number of tables, T, and the number of chairs, C, in the furniture shop.

$C = T + 8$ $\quad$ $C = 8T$ $\quad$ $T = 8C$ $\quad$ $T = C + 8$

(1)

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7. $8x = 5y$

Find the ratio $x : y$

5 : 8

.....

(1)

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8. $x : y = 4 : 15$

Work out how many times bigger y is than x

15 ÷ 4 = 3.75

3.75

.....

(1)

9. The ratio of $c : d$ is $3 : 4$

Which of the following is correct?
Circle your answer.

c is $\frac{3}{4}$ of d

c is $\frac{3}{7}$ of d

c is $\frac{4}{7}$ of d

c is $\frac{4}{3}$ of d

(1)

10. The ratio of $f : g$ is $9 : 2$

Which of the following is correct?
Circle your answer.

f is $\frac{2}{9}$ of g

f is $\frac{9}{11}$ of g

f is $\frac{2}{11}$ of g

f is $\frac{9}{2}$ of g

(1)

11. c is 50% more than d

Work out the ratio $c : d$

$c = 1.5d$

$2c = 3d$

$c : d = 3 : 2$

or

c	d
150	100
3	2

$3 : 2$

(2)

12. x is 20% less than y

Work out the ratio $x : y$

$x = 0.8y$

$x = \frac{4}{5}y$

$5x = 4y$

$x : y = 4 : 5$

or

x	y
80	100
4	5

$4 : 5$

(2)

13. y is $2\frac{1}{2}$ times x

Write down the ratio $y : x$

$y = 2.5x$

$y = \frac{5}{2}x$

$2y = 5x$

$y : x = 5 : 2$

or

y	x
250	100
5	2

$5 : 2$

(2)

14. $5w = \frac{1}{4}y$

Find the ratio $w : y$

$20w = y$

$w : y = 1 : 20$

1 : 20

(2)

15. $8x + 2y = 5y - 2x$

Find the ratio $x : y$

$8x + 2y = 5y - 2x$

$10x = 3y$

$x : y = 3 : 10$

3 : 10

(2)

16. $2c = 5d$

Complete the following statement.

c is 250 % of d

$2c = 5d$

$c : d = 5 : 2$

$5 \div 2 = 2.5$

(2)

17. $c : d = 7 : 4$

Find the value of $\frac{2c}{3d}$

$c : d = 7 : 4$

$4c = 7d$

$\frac{2c}{3d} = \frac{4c}{6d}$

$= \frac{7d}{6d}$

$\frac{7}{6}$

.....

(2)

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18. $x : y = \frac{2}{5} : \frac{1}{3}$

Write x in terms of y

$\frac{1}{3}x = \frac{2}{5}y$

$\times 15 \qquad \times 15$

$5x = 6y$

$x = \frac{6}{5}y$

.....

(2)

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19. $\frac{3}{5} : \frac{4}{9} = 1 : y$

Find the value of y

$\frac{3}{5} : \frac{4}{9}$

$\div \frac{3}{5} \qquad \div \frac{3}{5}$

$1 : \frac{20}{27}$

$\frac{20}{27}$

.....

(2)

20. w is a third of $4c$

Find the ratio $c : w$

$w = \frac{4c}{3}$

$3w = 4c$

$w : c = 4 : 3$

$c : w = 3 : 4$

3 : 4

(2)

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21. $x : y = 5 : 6$

$y : z = 10 : 3$

Write z in terms of x

x	y	z
5	6	
	10	3
25	30	9

$z : x = 9 : 25$

$25z = 9x$

$z = \frac{9}{25}x$

$z = \frac{9}{25}x$

(2)

22. $w = 5y$

$z = 4w$

Write down $y : z$

$z = 4(5y)$

$z = 20y$

$z : y = 20 : 1$

$y : z = 1 : 20$

1 : 20

.....

(2)

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23. $x : y = 11 : 2$

$12y = 5z$

Work out $x : z$

x	y	z
11	2	
	5	12
55	10	24

$y : z = 5 : 12$

55 : 24

.....

(3)

24. $5x = 3y$

$4y = 7z$

where x, y and z are positive numbers.

Find the ratio $x : y : z$

x	y	z
3	5	
	7	4
21	35	20

$x : y = 3 : 5$

$y : z = 7 : 4$

21 : 35 : 20

(2)

25. $9x + y = 2x + 5y$

Find the ratio $x : y$

$7x = 4y$

$x : y = 4 : 7$

4 : 7

(2)

26. $3x = 4z$ $x : z = 4 : 3$

y is five sixths of z

Find the ratio $x : y : z$

x	y	z
4		3
	5	6
8	5	6

$y = \frac{5}{6}z$

$6y = 5z$

$y : z = 5 : 6$

$8 : 5 : 6$

(3)

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27. $x = 3y$

$\frac{2y + 3z}{4x + z} = \frac{2}{5}$

Find the ratio $y : z$

$5(2y + 3z) = 2(4x + z)$

$10y + 15z = 8x + 2z$

$10y + 15z = 8(3y) + 2z$

$10y + 15z = 24y + 2z$

$13z = 14y$

$z : y = 14 : 13$

$y : z = 13 : 14$

$13 : 14$

(4)

28. C, D and E are such that

$C : D = 1 : 5$

D is $\frac{3}{4}$ of E

Work out the ratio $C : E$

$D = \frac{3}{4} E$

$40 = 3E$

$D : E = 3 : 4$

$C : D = 1 : 5$

C	D	E
1	5	
	3	4
3	15	20

3 : 20

.....

(3)

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29. Given that $x^2 : (5x - 24) = 4 : 1$

Find the possible values of x.

$x^2 = 4(5x - 24)$

$x^2 = 20x - 96$

$x^2 - 20x + 96 = 0$

$(x - 8)(x - 12) = 0$

$x = 8$ or $x = 12$

8 and 12

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(4)

30. Given that $x^2 : (x + 6) = 1 : 2$

Find the possible values of x.

$2x^2 = x + 6$

$2x^2 - x - 6 = 0$

$(2x + 3)(x - 2) = 0$

$2x = -3$

$x = -\frac{3}{2}$ or $x = 2$

$-\frac{3}{2}$ or 2

(4)

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31. $c : d = 2 : 11$

$\frac{d - c}{3} = 57$

Work out the values of c and d.

$d - c = 171$

$c : d = 2 : 11$

$11c = 2d$

$d = \frac{11}{2}c$

$\frac{11}{2}c - c = 171$

$4.5c = 171$

$c = 38$

$d - c = 171$

$d - 38 = 171$

$d = 209$

$c =$ 38 $d =$ 209

(5)

32. Given $(2x - 4) : (x + 1) = (2x + 7) : 6x$

and $x > 0$

Find the value of x.

$$\frac{2x-4}{x+1} = \frac{2x+7}{6x}$$

$$6x(2x-4) = (2x+7)(x+1)$$

$$12x^2 - 24x = 2x^2 + 9x + 7$$

$$10x^2 - 33x - 7 = 0$$

$$(5x + 1)(2x - 7) = 0$$

$x = -\frac{1}{5}$ ✗ or $x = \frac{7}{2}$ ✓

3.5

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(5)