Ratio and Proportion

An equation that sets two ratios equal to one another is a proportion.
Use the means–extremes property to solve a proportion.
The product of the means is equal to the product of the extremes.

$a : b = c : d$ (means: b, c; extremes: a, d)

$bc = ad$

OR

$\frac{a}{b} = \frac{c}{d}$

b and c are means
a and d are extremes
$bc = ad$

Solve the proportions below. Use the decoder to find the name of a special ratio and where it is found in ancient times.

1. $\frac{7}{4} = \frac{21}{x}$
2. $\frac{3x}{6} = \frac{12}{4}$
3. $\frac{x+5}{4} = \frac{1}{2}$
4. $\frac{x+2}{x+3} = \frac{4}{5}$
5. $\frac{18}{x} = \frac{9}{4}$
6. $\frac{3}{4} = \frac{18}{x}$
7. $\frac{36}{x} = \frac{18}{8}$
8. $\frac{x}{9} = \frac{84}{108}$
9. $\frac{x-3}{x} = \frac{4}{5}$
10. $\frac{x}{6} = \frac{6}{4}$
11. $\frac{7x-5}{4} = \frac{x+9}{3}$
12. $\frac{5}{x-2} = \frac{15}{x+4}$
13. $\frac{x+6}{16} = \frac{x}{10}$
14. $\frac{x+9}{2} = \frac{5x}{1}$
15. $\frac{4x+2}{6x+13} = \frac{18}{17}$
16. $\frac{x}{12} = \frac{9}{4}$
17. $\frac{9}{4x} = \frac{3}{1}$
18. $\frac{2x+1}{18} = \frac{4x-3}{21}$
19. $\frac{x-1}{x} = \frac{6}{8}$
20. $\frac{2x+4}{3x-3} = \frac{13}{15}$
21. $\frac{5}{8} = \frac{x}{40}$

A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	R	S	T	U	W	Y
15	24	16	12	2	1	$\frac{3}{4}$	10	–5	4	6	$\frac{5}{2}$	11	9	27	5	7	3	25	–3	8

11 13 4 — 17 10 2 1 4 20 — 12 9 11 15 10

3 9 8 — 21 8 4 1 — 11 10 — 1 4 8 15 17 20

11 13 4 — 16 5 12 9 18 15 1 8 — 9 20 1

9 2 8 10 — 17 12 4 4 19 — 6 21 15 2 1 15 20 17 8

9 20 1 — 9 12 11 15 14 9 7 11 8