14 Solve, algebraically, these simultaneous equations.

$$2x - 3y = 14 \quad (1)$$
$$6x + 4y = 3 \quad (2)$$

(1) × 4 $\quad 8x - 12y = 56 \quad (3)$

(2) × 3 $\quad 18x + 12y = 9 \quad (4)$

(3) + (4) $\quad 26x = 65$

$x = \frac{65}{26}$

$x = 2\frac{1}{2}$

Sub for x in (2)

$15 + 4y = 3$

$4y = 3 - 15$

$4y = -12$

$y = \frac{-12}{4}$

$y = -3$

Solution

$x = 2\frac{1}{2}$

$y = -3$

16 **(a)** Solve, algebraically, these simultaneous equations.

$$3x - 5y = 111 \quad (1)$$
$$4x + 3y = -26 \quad (2)$$

(1) × 3 $\quad 9x - 15x = 333 \quad (3)$

(2) × 5 $\quad 20x + 15x = -130 \quad (4)$

(3) + (4) $\quad 29x = 203$

$x = \frac{203}{29} = 7$

Sub for x in ②

$4(7) + 3y = -26$

$28 + 3y = -26$

$3y = -26 - 28$

$3y = -54$

$y = -\frac{54}{3}$

$y = -18$

$\begin{cases} x = 7 \\ y = -18 \end{cases}$

15

14 Solve these simultaneous equations algebraically.

$3x + y = 13$ ①

$2x - y = 12$ ②

① + ②

$5x = 25$

$x = \frac{25}{5} = 5$

Sub for x in ①

$3(5) + y = 13$

$15 + y = 13$

$y = 13 - 15$

$y = -2$

$\begin{cases} x = 5 \\ y = -2 \end{cases}$

12 Solve algebraically these simultaneous equations.

$3x - y = 1$ ①

$5x + 3y = 4$ ②

① x 3

$9x - 3y = 3$ ③

② + ③

$14x = 7$

$x = \frac{7}{14} = \frac{1}{2}$

sub for x in ②

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

$$3y = 4 - \frac{5}{2}$$

$$3y = \frac{3}{2}$$

$$y = \frac{1}{2}$$

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

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2 Adults and 3 children = £28.20
3 Adults and 5 children = £44.75

Let adult ticket cost A
Let child ticket cost C

$$2A + 3C = £28.20 \quad ①$$
$$3A + 5C = £44.75 \quad ②$$

① × 5 $\quad 10A + 15C = £141 \quad ③$

② × 3 $\quad 9A + 15C = £134.25 \quad ④$

③ − ④ $\quad A = £6.75$

Sub in ① $\quad 2(6.75) + 3C = £28.20$

$$13.50 + 3C = £28.20$$

$$3C = £28.20 - £13.50$$

$$3C = £14.70$$

$$C = \frac{£14.70}{3}$$

$$C = £4.90$$

Adult £6.75
Child £4.90