Simultaneous equations

Student name: _____ Score: _____

1. Solve the simultaneous equations:

(a) $3x - 4y = 10$

$5x - 3y = 2$

Answer $x =$ ....

$y =$ ....

(b) $5x - 4y = 1$

$4x - 5y = 8$

Answer $x =$ ....

$y =$ ....

(c) $5x - 2y = 11.5$

$4x + 3y = 0$

Answer $x =$ ....

$y =$ ....

(d) $2x + 3y = 11$

$3x - 5y = -12$

Answer $x =$ ....

$y =$ ....

(e) $x + 2y - 18 = 0$

$3x - 4y - 4 = 0$

Answer $x =$ ....

$y =$ ....

(f) $2y + 3x = 6$

$x = 4y + 16$

Answer $x =$ ....

$y =$ ....

2. Solve the simultaneous equations

(a) $\frac{1}{2}x + y = 5$

$x - 2y = 6$

Answer $x =$ ....

$y =$ ....

(b) $\frac{1}{2}x + 2y = 16$

$2x + \frac{1}{2}y = 19$

Answer $x =$ ....

$y =$ ....

(c) $2x + \frac{1}{2}y = 1$

$6x - \frac{3}{2}y = 21$

Answer $x =$ ....

$y =$ ....

(d) $0.4x + 2y = 10$

$0.3x + 5y = 18$

Answer $x =$ ....

$y =$ ....

3. A hotel has a rectangular swimming pool. Its length is x metres, its width is y metres and its perimeter is 44 metres.

   (a)   Write down an equation for x and y.   *[1]*

   The area of the swimming pool is $112\,\mathrm{m}^2$.

   (b)   Write down a second equation for x and y.   *[1]*

   (c)   Use your graphic display calculator to find the value of x and the value of y.   *[2]*

   An Olympic sized swimming pool is 50 m long and 25 m wide.

   (d)   Determine the area of the hotel swimming pool as a percentage of the area of an Olympic sized swimming pool.   *[2]*

4. Passengers of Flyaway Airlines can purchase tickets for either Business Class or Economy Class.

   On one particular flight there were 154 passengers.

   Let x be the number of Business Class passengers and y be the number of Economy Class passengers on this flight.

   (a)   Use the above information to write down an equation in x and y.   [1]

   On this flight, the cost of a ticket for each Business Class passenger was 320 euros and the cost of a ticket for each Economy Class passenger was 85 euros. The total amount that Flyaway Airlines received for these tickets was 14970 euros.

   (b)   Use the information about the cost of tickets to write down a second equation in x and y.   [1]

   (c)   Find the value of x and the value of y.   [2]

   The airline's finance officer wrote down the total amount received by the airline for these tickets as 14270 euros.

   (d)   Find the percentage error.   [2]

Simultaneous equations

Student name: ANSWERS Score: _____

1. Solve the simultaneous equations:

(a) $3x - 4y = 10$

$5x - 3y = 2$

Answer $x =$ ....−2..........

$y =$ ....−4..........

(b) $5x - 4y = 1$

$4x - 5y = 8$

Answer $x =$ ....−3..........

$y =$ ....−4..........

(c) $5x - 2y = 11.5$

$4x + 3y = 0$

Answer $x =$ ....1.5..........

$y =$ ....−2..........

(d) $2x + 3y = 11$

$3x - 5y = -12$

Answer $x =$ ....1..........

$y =$ ....3..........

(e) $x + 2y - 18 = 0$

$3x - 4y - 4 = 0$

Answer $x =$ ....8..........

$y =$ ....5..........

(f) $2y + 3x = 6$

$x = 4y + 16$

Answer $x =$ ....$\dfrac{72}{11}$..........

$y =$ ....$-\dfrac{26}{11}$..........

2. Solve the simultaneous equations

(a) $\frac{1}{2}x + y = 5$

$x - 2y = 6$

Answer $x =$ ....8..........

$y =$ ....1..........

(b) $\frac{1}{2}x + 2y = 16$

$2x + \frac{1}{2}y = 19$

Answer $x =$ ....8..........

$y =$ ....6..........

(c) $2x + \frac{1}{2}y = 1$

$6x - \frac{3}{2}y = 21$

Answer $x =$ ....2..........

$y =$ ....−6..........

(d) $0.4x + 2y = 10$

$0.3x + 5y = 18$

Answer $x =$ ....10..........

$y =$ ....3..........

3. A hotel has a rectangular swimming pool. Its length is x metres, its width is y metres and its perimeter is 44 metres.

(a) Write down an equation for x and y. $2x + 2y = 44$ [1]

The area of the swimming pool is $112\,\text{m}^2$.

(b) Write down a second equation for x and y. $y = \dfrac{112}{x}$ [1]

(c) Use your graphic display calculator to find the value of x and the value of y.   [2]

$$x = 8 \qquad x = 14$$

An Olympic sized swimming pool is $50\,\text{m}$ long and $25\,\text{m}$ wide.

$$y = 14 \qquad y = 8$$

(d) Determine the area of the hotel swimming pool as a percentage of the area of an Olympic sized swimming pool. 8.96% [2]

4. Passengers of Flyaway Airlines can purchase tickets for either Business Class or Economy Class.

On one particular flight there were 154 passengers.

Let x be the number of Business Class passengers and y be the number of Economy Class passengers on this flight.

(a) Use the above information to write down an equation in x and y. $x + y = 154$ [1]

On this flight, the cost of a ticket for each Business Class passenger was 320 euros and the cost of a ticket for each Economy Class passenger was 85 euros. The total amount that Flyaway Airlines received for these tickets was 14970 euros.

(b) Use the information about the cost of tickets to write down a second equation in x and y.

$$85x + 320y = 14970$$ [1]

(c) Find the value of x and the value of y. $x = 146$ $y = 8$ [2]

The airline's finance officer wrote down the total amount received by the airline for these tickets as 14270 euros.

(d) Find the percentage error. 4.676% [2]