

SOLVING EQUATIONS

A DEFINITIONS

A.1 MATH ESCAPE ROOM LEVEL 1

MCQ 1: For this Math escape room, the code is:

$$\bigcirc + 5 = 9$$

Which code do you use to enter?

☐ $\bigcirc = 2$

☐ $\bigcirc = 4$

☐ $\bigcirc = 5$

☐ $\bigcirc = 9$

MCQ 2: For this Math escape room, the code is:

$$\triangle + 10 = 1 + 2 \times 6$$

Which code do you use to enter?

☐ $\triangle = 3$

☐ $\triangle = 5$

☐ $\triangle = 8$

☐ $\triangle = 10$

MCQ 3: For this Math escape room, the code is:

$$\square + 5 = 2 \times 4 + 1$$

Which code do you use to enter?

☐ $\square = 6$

☐ $\square = 8$

☐ $\square = 5$

☐ $\square = 4$

MCQ 4: For this Math escape room, the code is:

$$\bigcirc - 4 = 3 \times 2 - 1$$

Which code do you use to enter?

☐ $\bigcirc = 7$

☐ $\bigcirc = 6$

☐ $\bigcirc = 5$

☐ $\bigcirc = 9$

A.2 MATH ESCAPE ROOM LEVEL 2

MCQ 5: For this Math escape room, the code is:

$$2 \times \bigcirc - 2 = \bigcirc + 10$$

Which code do you use to enter?

☐ $\bigcirc = 8$

☐ $\bigcirc = 10$

☐ $\bigcirc = 12$

☐ $\bigcirc = 14$

MCQ 6: For this Math escape room, the code is:

$$3x + 7 = x + 19$$

Which code do you use to enter?

☐ $x = 2$

☐ $x = 4$

☐ $x = 6$

☐ $x = 8$

MCQ 7: For this Math escape room, the code is:

$$2x - 2 = x + 10$$

Which code do you use to enter?

☐ $x = 6$

☐ $x = 8$

☐ $x = 10$

☐ $x = 12$

MCQ 8: For this Math escape room, the code is:

$$x \times (x - 2) = 24$$

Which code do you use to enter?

☐ $x = 6$

☐ $x = 7$

☐ $x = 8$

☐ $x = 9$

A.3 MATH ESCAPE ROOM LEVEL 3

MCQ 9: For this Math escape room, the code is:

$$x^2 - 4 = 0$$

Which code do you use to enter?

- ☐ $x = 2$
☐ $x = 3$
☐ $x = 4$
☐ $x = 5$

MCQ 10: For this Math escape room, the code is:

$$x^2 - 2x + 1 = 0$$

Which code do you use to enter?

- ☐ $x = 0$
☐ $x = 1$
☐ $x = 2$
☐ $x = 3$

MCQ 11: For this Math escape room, the code is:

$$\frac{2x+1}{x-1} = 3$$

Which code do you use to enter?

- ☐ $x = 2$
☐ $x = 3$
☐ $x = 4$
☐ $x = 5$

B SOLVING BY TRIAL AND ERROR

B.1 FINDING A SOLUTION LEVEL 1

Ex 12: Consider the equation $2x + 3 = 11$.
Use the trial-and-error method to find a solution (try $x = 2, 3, \dots$).

$$x = \boxed{}$$

Ex 13: Consider the equation $3x - 5 = 10$.
Use the trial-and-error method to find a solution (try $x = 4, 5, \dots$).

$$x = \boxed{}$$

Ex 14: Consider the equation $x(x - 1) = 6$.
Use the trial-and-error method to find a solution (try $x = 2, 3, \dots$).

$$x = \boxed{}$$

Ex 15: Consider the equation $2x - 3 = 5x - 9$.
Use the trial-and-error method to find a solution (try $x = 0, 1, \dots$).

$$x = \boxed{}$$

B.2 FINDING A SOLUTION LEVEL 2

Ex 16: Consider the equation $x^2 - 2x + 1 = 0$.
Use the trial-and-error method to find a solution (try $x = 0, 1, \dots$).

$$x = \boxed{}$$

Ex 17: Consider the equation $x^2 - 9 = 0$.
Use the trial-and-error method to find a solution (try $x = 2, 3, \dots$).

$$x = \boxed{}$$

Ex 18: Consider the equation $\frac{x+2}{x-2} = 2$.
Use the trial-and-error method to find a solution (try $x = 6, 3, 4$).

$$x = \boxed{}$$

C EQUIVALENT EQUATIONS

C.1 SOLVING EQUATIONS BY ADDING OR SUBTRACTING

Ex 19: Solve for x :

$$x + 10 = 80$$

$$x = \boxed{}$$

Ex 20: Solve for x :

$$x + 20 = 36$$

$$x = \boxed{}$$

Ex 21: Solve for x :

$$x + 1 = 100$$

$$x = \boxed{}$$

Ex 22: Solve for x :

$$x + 0.5 = 3$$

$$x = \boxed{} \text{ (write in decimal form)}$$

Ex 23: Solve for x :

$$x - 10 = -20$$

$$x = \boxed{}$$

Ex 24: Solve for x :

$$x - 5 = -2$$

$$x = \boxed{}$$

C.2 SOLVING EQUATIONS BY MULTIPLYING OR DIVIDING

Ex 25: Solve for x :

$$2x = 16$$

$$x = \boxed{}$$

Ex 26: Solve for x :

$$2x = 30$$

$$x = \boxed{}$$

Ex 27: Solve for x :

$$3x = 27$$

$$x = \boxed{}$$

Ex 28: Solve for x :

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

$$x = \boxed{}$$

Ex 29: Solve for x :

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

$$x = \boxed{} \text{ (write in decimal form)}$$

$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$
$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$
$\square \xrightarrow{+3}$	$\square \xrightarrow{+3}$	$\square \xrightarrow{+3}$	$\square \xrightarrow{+3}$
$\square \xrightarrow{-3}$	$\square \xrightarrow{-3}$	$\square \xrightarrow{-3}$	$\square \xrightarrow{-3}$

Ex 34: Do the expression $2 - 5x$

$\square \xrightarrow{\times(-5)}$	$\square \xrightarrow{\times(-5)}$	$\square \xrightarrow{\times(-5)}$	$\square \xrightarrow{\times(-5)}$
$\square \xrightarrow{\div(-5)}$	$\square \xrightarrow{\div(-5)}$	$\square \xrightarrow{\div(-5)}$	$\square \xrightarrow{\div(-5)}$
$\square \xrightarrow{+1}$	$\square \xrightarrow{+1}$	$\square \xrightarrow{+1}$	$\square \xrightarrow{+1}$
$\square \xrightarrow{-1}$	$\square \xrightarrow{-1}$	$\square \xrightarrow{-1}$	$\square \xrightarrow{-1}$

Ex 35: Do the expression $2(x - 3)$

$\square \xrightarrow{-3}$	$\square \xrightarrow{-3}$	$\square \xrightarrow{-3}$	$\square \xrightarrow{-3}$
$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$
$\square \xrightarrow{+3}$	$\square \xrightarrow{+3}$	$\square \xrightarrow{+3}$	$\square \xrightarrow{+3}$
$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$

Ex 36: Do the expression $\frac{x - 3}{2}$

$\square \xrightarrow{-3}$	$\square \xrightarrow{-3}$	$\square \xrightarrow{-3}$	$\square \xrightarrow{-3}$
$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$
$\square \xrightarrow{+3}$	$\square \xrightarrow{+3}$	$\square \xrightarrow{+3}$	$\square \xrightarrow{+3}$
$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$

D DOING AND UNDOING EXPRESSIONS

D.1 DOING EXPRESSIONS

Ex 30: Do the expression $3 + 5x$

$\square \xrightarrow{\times 5}$	$\square \xrightarrow{\times 5}$	$\square \xrightarrow{\times 5}$	$\square \xrightarrow{\times 5}$
$\square \xrightarrow{\div 5}$	$\square \xrightarrow{\div 5}$	$\square \xrightarrow{\div 5}$	$\square \xrightarrow{\div 5}$
$\square \xrightarrow{+3}$	$\square \xrightarrow{+3}$	$\square \xrightarrow{+3}$	$\square \xrightarrow{+3}$
$\square \xrightarrow{-3}$	$\square \xrightarrow{-3}$	$\square \xrightarrow{-3}$	$\square \xrightarrow{-3}$

Ex 31: Do the expression $2x + 1$

$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$
$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$
$\square \xrightarrow{+1}$	$\square \xrightarrow{+1}$	$\square \xrightarrow{+1}$	$\square \xrightarrow{+1}$
$\square \xrightarrow{-1}$	$\square \xrightarrow{-1}$	$\square \xrightarrow{-1}$	$\square \xrightarrow{-1}$

Ex 32: Do the expression $5x - 1$

$\square \xrightarrow{\times 5}$	$\square \xrightarrow{\times 5}$	$\square \xrightarrow{\times 5}$	$\square \xrightarrow{\times 5}$
$\square \xrightarrow{\div 5}$	$\square \xrightarrow{\div 5}$	$\square \xrightarrow{\div 5}$	$\square \xrightarrow{\div 5}$
$\square \xrightarrow{+1}$	$\square \xrightarrow{+1}$	$\square \xrightarrow{+1}$	$\square \xrightarrow{+1}$
$\square \xrightarrow{-1}$	$\square \xrightarrow{-1}$	$\square \xrightarrow{-1}$	$\square \xrightarrow{-1}$

Ex 33: Do the expression $\frac{x}{2} + 3$

D.2 UNDOING EXPRESSIONS

Ex 37: Undo the expression $2x + 1$

$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$	$\square \xrightarrow{\times 2}$
$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$	$\square \xrightarrow{\div 2}$
$\square \xrightarrow{+1}$	$\square \xrightarrow{+1}$	$\square \xrightarrow{+1}$	$\square \xrightarrow{+1}$
$\square \xrightarrow{-1}$	$\square \xrightarrow{-1}$	$\square \xrightarrow{-1}$	$\square \xrightarrow{-1}$

Ex 38: Undo the expression $3x - 2$

$\square \xrightarrow{\times 3}$	$\square \xrightarrow{\times 3}$	$\square \xrightarrow{\times 3}$	$\square \xrightarrow{\times 3}$
$\square \xrightarrow{\div 3}$	$\square \xrightarrow{\div 3}$	$\square \xrightarrow{\div 3}$	$\square \xrightarrow{\div 3}$
$\square \xrightarrow{+2}$	$\square \xrightarrow{+2}$	$\square \xrightarrow{+2}$	$\square \xrightarrow{+2}$
$\square \xrightarrow{-2}$	$\square \xrightarrow{-2}$	$\square \xrightarrow{-2}$	$\square \xrightarrow{-2}$

Ex 39: Undo the expression $\frac{x}{3} + 2$

$\square \xrightarrow{\times 3}$	$\square \xrightarrow{\times 3}$	$\square \xrightarrow{\times 3}$	$\square \xrightarrow{\times 3}$
$\square \xrightarrow{\div 3}$	$\square \xrightarrow{\div 3}$	$\square \xrightarrow{\div 3}$	$\square \xrightarrow{\div 3}$
$\square \xrightarrow{+2}$	$\square \xrightarrow{+2}$	$\square \xrightarrow{+2}$	$\square \xrightarrow{+2}$
$\square \xrightarrow{-2}$	$\square \xrightarrow{-2}$	$\square \xrightarrow{-2}$	$\square \xrightarrow{-2}$

Ex 40: Undo the expression $\frac{x+2}{5}$

☐ $\frac{(x+2)}{5}$	☐ $\xrightarrow{\times 5}$	☐ $\frac{(x+2)}{5}$	☐ $\xrightarrow{\times 5}$
☐ $x+2$	☐ $\xrightarrow{\div 5}$	☐ $x+2$	☐ $\xrightarrow{\div 5}$
☐ x	☐ $\xrightarrow{+2}$	☐ x	☐ $\xrightarrow{+2}$
	☐ $\xrightarrow{-2}$	☐ x	☐ $\xrightarrow{-2}$
	☐ $\frac{(x+2)}{5}$		
	☐ $x+2$		
	☐ x		

E SOLVING LINEAR EQUATIONS

E.1 SOLVING LINEAR EQUATIONS: LEVEL 1

Ex 41: Solve for x :

$$2x + 1 = 7$$

$$x = \boxed{}$$

Ex 42: Solve for x :

$$2x - 4 = 5$$

$$x = \boxed{}$$

Ex 43: Solve for x :

$$4x - 7 = 9$$

$$x = \boxed{}$$

Ex 44: Solve for x :

$$3x + 10 = 4$$

$$x = \boxed{}$$

E.2 SOLVING LINEAR EQUATIONS: LEVEL 2

Ex 45: Solve for x :

$$\frac{x-17}{3} = 10$$

$$x = \boxed{}$$

Ex 46: Solve for x :

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

$$x = \boxed{}$$

Ex 47: Solve for x :

$$4(x+2) = 40$$

$$x = \boxed{}$$

Ex 48: Solve for x :

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

$$x = \boxed{}$$