

Equation Escape Room

Expand, combine, and solve.

GRADE 8 • 8.EE.C.7b

CCSS.Math.Content.8.EE.C.7b "Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms."

NAME _____

DATE _____

CLEAR THE EQUATION

Use the distributive property to multiply every term inside parentheses. Then collect like terms, use inverse operations to isolate x , and check that your solution makes both sides equal.

WORKED EXAMPLE

Solve: $(\frac{7}{13})(x + 26) - 19 = 9$

1. Distribute: $\frac{7}{13}x + 14 - 19 = 9$
2. Combine constants: $\frac{7}{13}x - 5 = 9$
3. Add 5: $\frac{7}{13}x = 14$
4. Multiply by $\frac{13}{7}$: $x = 26$

Answer: $x = 26$

PRACTICE 6 problems

1 Solve: $(\frac{1}{2})(x + 12) + 5 = 21$

ANSWER _____

2 Solve: $(\frac{5}{6})(x - 12) + 6 = 16$

ANSWER _____

3 Solve: $(\frac{2}{5})(x - 15) - 6 = 4$

ANSWER _____

4 Solve: $(\frac{3}{4})(x + 8) + (\frac{1}{4})x = 16$

ANSWER _____

5 Solve: $(\frac{3}{5})(x + 10) + 2 = (\frac{1}{5})(x + 20) + 8$

ANSWER _____

6 Solve: $(\frac{1}{3})(x - 12) + (\frac{5}{6})(x + 6) = 15$

ANSWER _____

APPLY IT Show your work

- 1** In a mobile game, a booster gives you $\frac{2}{3}$ of the sum of your match coins, x , and 15 bonus coins. After you pay a 5-coin entry fee, you have 25 coins. How many match coins did you earn?

WORK SPACE

ANSWER _____

- 2** At a dance competition, a practice score is calculated as $\frac{3}{5}$ of the sum of x timing points and 10 bonus points, plus $\frac{2}{5}$ of x style points. The final score is 34. What is x ?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve: $(\frac{5}{12})(x - 18) + (\frac{1}{3})x = (\frac{1}{4})(x + 12) + 11$

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Solve: $(1/2)(x + 12) + 5 = 21$	x = 20
2	Solve: $(5/6)(x - 12) + 6 = 16$	x = 24
3	Solve: $(2/5)(x - 15) - 6 = 4$	x = 40
4	Solve: $(3/4)(x + 8) + (1/4)x = 16$	x = 10
5	Solve: $(3/5)(x + 10) + 2 = (1/5)(x + 20) + 8$	x = 10
6	Solve: $(1/3)(x - 12) + (5/6)(x + 6) = 15$	x = 12

PART 2 • APPLY IT

1. **30 coins** Write $(2/3)(x + 15) - 5 = 25$. Distribute, then solve to get $x = 30$.
2. **x = 28** Write $(3/5)(x + 10) + (2/5)x = 34$. Distribute and combine the x terms to get $x + 6 = 34$, so $x = 28$.

CHALLENGE

x = 43

Accept any equivalent equation steps that correctly distribute, combine like terms, and isolate x . Fraction answers or decimal forms are acceptable when they are equivalent, although all solutions here are integers.