



MATH WITH MR DJ

GRADE 6 · EXPRESSIONS & EQUATIONS

EQUIVALENT EXPRESSIONS

Today's goal: I can determine whether expressions are equivalent using the properties of operations to simplify or expand expressions, use substitution of the variable to determine whether expressions are equivalent and explain whether expressions are equivalent using the properties of operations and substitution of the variable.



Tan



Digit



Blaze



Pi



Are $3x$ and $x + 2$ the same?

1 Try $x = 1$. Both give 3.

TURN & TALK

does that settle it?



Equivalent means **EVERY** value

- 1 Not 'one value that works' — every value, always.
- 2 Two ways to decide: simplify/expand until the forms match, or substitute several values.



WATCH OUT!

$3x$ and $x + 2$ are NOT equivalent

1 $x = 1 \rightarrow 3$ and $3 \checkmark$ (agree)

2 $x = 2 \rightarrow 6$ and $4 \times$ (disagree)

DON'T FALL FOR IT

They cross at exactly one point. One test would have fooled you.



BIG IDEA 3

Beware $x = 0$ and $x = 1$

- 1 At $x = 0$, every x term vanishes: $2x$ and $5x$ both give 0.
- 2 At $x = 1$, coefficients hide: many pairs coincide.

REMEMBER

If you test one value, never make it 0 or 1.



BIG IDEA 4

The asymmetry

- 1 One value where they AGREE $\rightarrow$ proves nothing.
- 2 One value where they DIFFER $\rightarrow$ proves they are not equivalent.

REMEMBER

Proving needs all values. Disproving needs one.



SPOT THE SLIP!

Turn & talk

Something went wrong here...

THE PROBLEM

Are $x + x + x$ and $3x$ equivalent? Explain.

WHAT A STUDENT DID

Said no, or wrote x^3 .

YOUR MISSION

What went wrong? What's the right answer?



Are $x + x + x$ and $3x$ equivalent? Explain.

1 Three x's added is 3 groups of x.

Answer:

Equivalent



Pick your pepper!



☛ MILD

Are $2x$ and $5x$ equivalent?
Test $x = 0$ and $x = 3$, then
decide.

#1 on your practice sheet



☛☛ MEDIUM

Are $7x - 3x$ and $4x$
equivalent? Explain.

#3 on your practice sheet



☛☛☛ SPICY

Are $6x + 3$ and $3(2x + 1)$
equivalent? Show it two
different ways.

#6 on your practice sheet

How's it going?



3 • Got it!

I could teach it



2 • Almost

One more example, please



1 • Not yet

I need some help



MATH WITH MR DJ

NOW YOU!

Practice sheet: everyone does Mild & Medium, then climb the peppers.

Stuck? Look back at Mr DJ's example at the top of the sheet.

Need it again? Watch "Combining Like Terms - Watch me solve this in under 2 minutes - then you try one!" on YouTube @MathWithMrDJ

Brain break: 3 new daily puzzles at puzzles.mathwithmrdj.com

