# EUREKA MATH² ™

## Lesson 12:

**Subtract whole numbers from mixed numbers and mixed numbers from whole numbers.**

**CCSS Standard – 5.NF.A.1 / 5.NF.A.2**

**Whiteboard Exchange: Make the Next Whole Number**

**Write and complete the equation.**

$$\frac{2}{3} + \underline{\quad\quad} = 1$$

**Whiteboard Exchange: Make the Next Whole Number**

**Write and complete the equation.**

$$\boxed{\phantom{x}} + \frac{3}{6} = 1$$

Whiteboard Exchange: Make the Next Whole Number

**Write and complete the equation.**

$$\frac{4}{7} + \underline{\phantom{\frac{\square}{\square}}} = 1$$

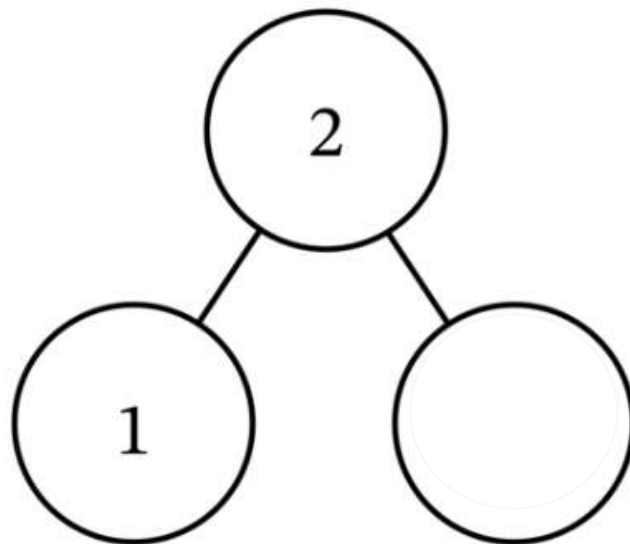Whiteboard Exchange: Make the Next Whole Number

**Write and complete the equation.**

$$\underline{\phantom{XXX}} + \frac{3}{10} = 1$$

**Choral Response: Decompose Whole Numbers**

**What is the unknown part? Raise your hand when you know.**
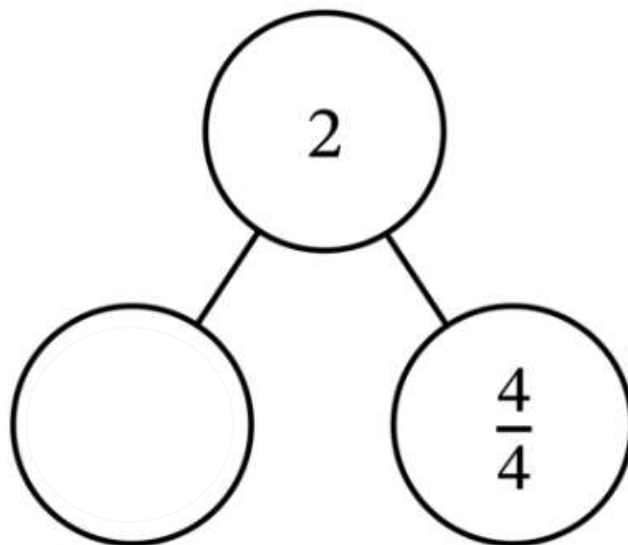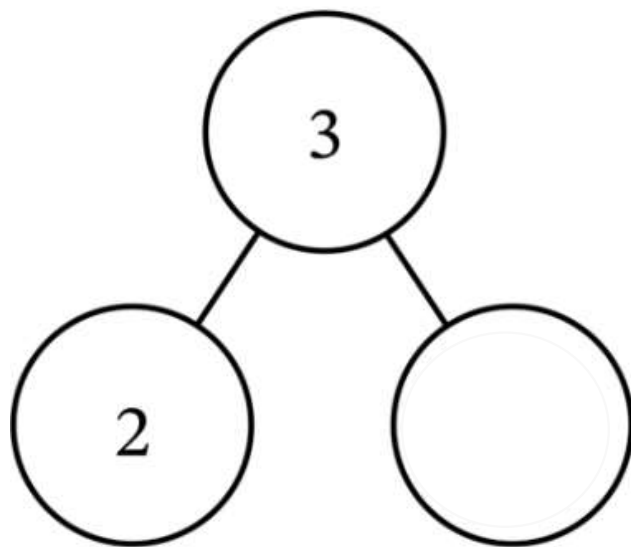**When I give the signal, say the completed equation. Ready?**



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

**What is the unknown part? Raise your hand when you know.**
**When I give the signal, say the completed equation. Ready?**



$$2 = \underline{\quad} + \frac{4}{4}$$

**What is the unknown part? Raise your hand when you know.**
**When I give the signal, say the completed equation. Ready?**
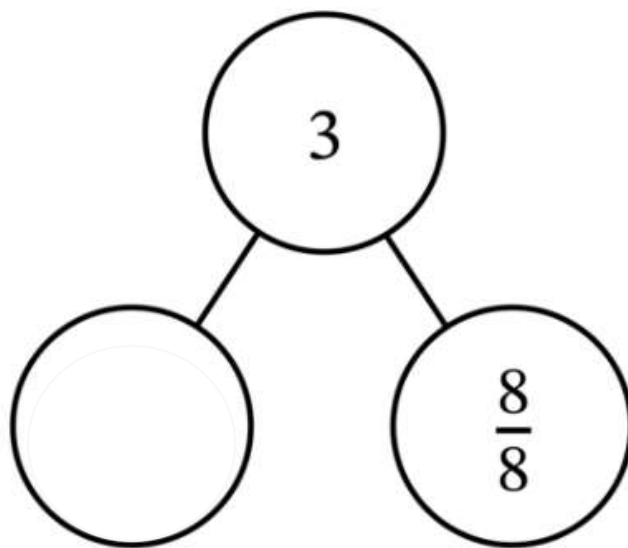
$$3 = 2 + \frac{\Box}{6}$$

**What is the unknown part? Raise your hand when you know.**
**When I give the signal, say the completed equation. Ready?**

$$3 = \underline{\quad} + \frac{8}{8}$$

**Choral Response: Decompose Whole Numbers**

**What is the unknown part? Raise your hand when you know.**
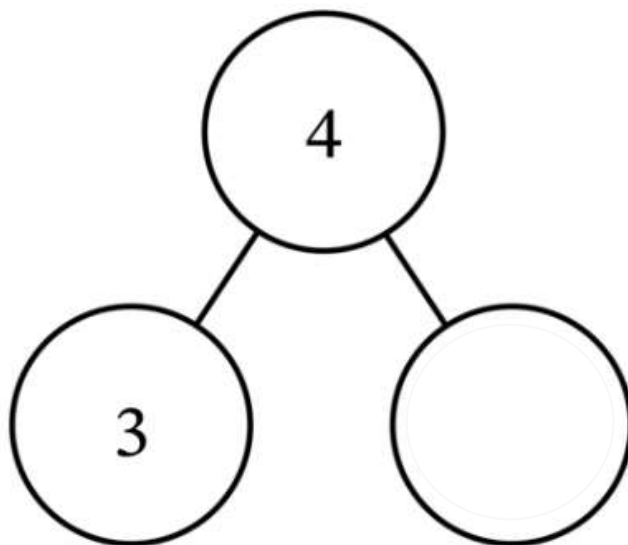**When I give the signal, say the completed equation. Ready?**

$$4 = 3 + \frac{\boxed{\phantom{0}}}{9}$$

**Choral Response: Decompose Whole Numbers**

**What is the unknown part? Raise your hand when you know.**
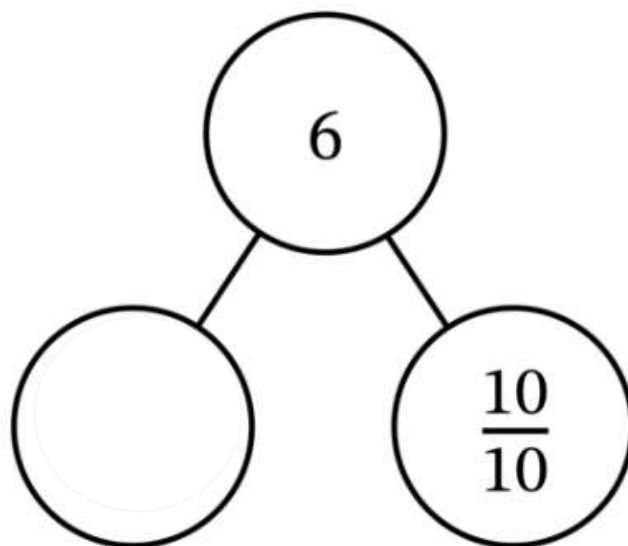**When I give the signal, say the completed equation. Ready?**



$$6 = \underline{\quad} + \frac{10}{10}$$

**Which fraction can we <u>rename</u> so the fractional units are the same?**
**Raise your hand when you know?**

$$\frac{3}{4} - \frac{1}{2}$$

**We should rename 1/2 into fourths.**

$$\frac{3}{4} - \frac{2}{4} = \frac{1}{4}$$

**Whiteboard Exchange: Make LIKE Units**

Which fraction can we <u>rename</u> so the fractional units are the same?
Raise your hand when you know?

$$\frac{2}{3} - \frac{1}{6}$$

We should rename 2/3 into sixths.

$$\frac{4}{6} - \frac{1}{6} = \frac{3}{6}$$

**Which fraction can we <u>rename</u> so the fractional units are the same?**
**Raise your hand when you know?**

$$\frac{7}{10} - \frac{2}{5}$$

**We should rename 2/5 into tenths.**

$$\frac{7}{10} - \frac{4}{10} = \frac{3}{10}$$

**Whiteboard Exchange: Make LIKE Units**

**Which fraction can we <u>rename</u> so the fractional units are the same?**
**Raise your hand when you know?**

$$\frac{3}{4} - \frac{5}{12}$$

**We should rename 3/4 into twelfths.**

$$\frac{9}{12} - \frac{5}{12} = \frac{4}{12}$$

**Analyze different ways of finding a difference of whole numbers.**

**THINK-PAIR-SHARE**

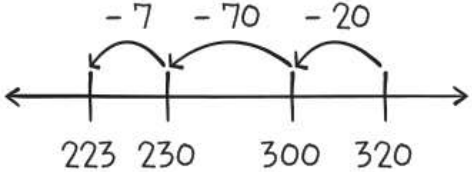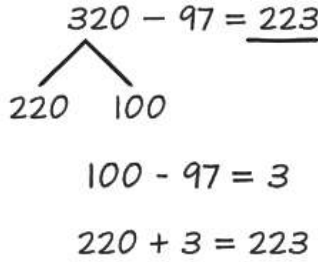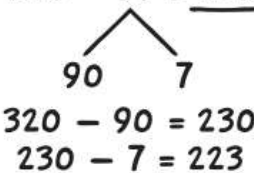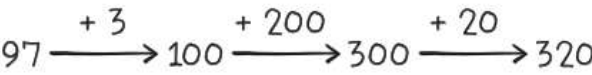**What are the similarities and differences shown in the sample work?**

*All four methods show 320 – 97 = 223*

*A, B, and C all use decomposition.*

*A and C both decompose 97, while B decomposes 320.*

*D shows the difference as an unknown part.*

**Today, we will explore how to apply these methods to help us subtract when expressions have whole numbers, fractions, and mixed numbers.**

A

$$320 - 97 = \underline{223}$$

$-7 \quad -70 \quad -20$

223  230     300   320

B

$$320 - 97 = \underline{223}$$

220   100

$$100 - 97 = 3$$

$$220 + 3 = 223$$

C

$$320 - 97 = \underline{223}$$

90     7

$$320 - 90 = 230$$

$$230 - 7 = 223$$

D

$$320 - 97 = \underline{223}$$

$+3 \qquad +200 \qquad +20$

$97 \longrightarrow 100 \longrightarrow 300 \longrightarrow 320$
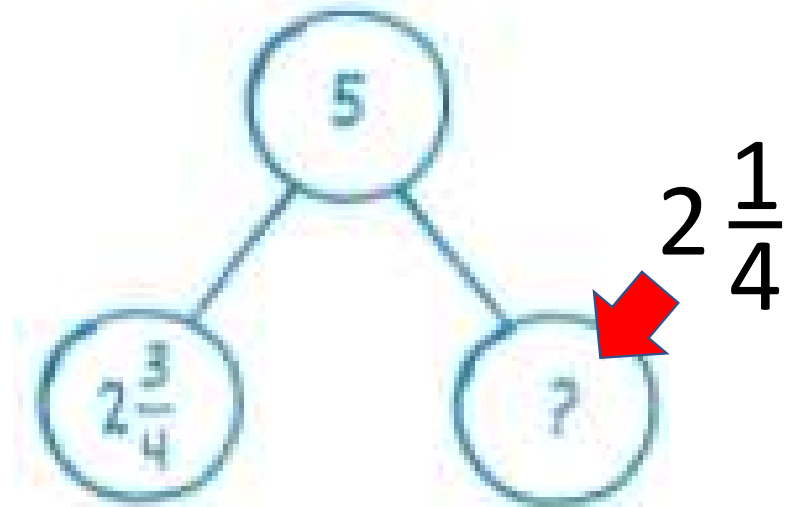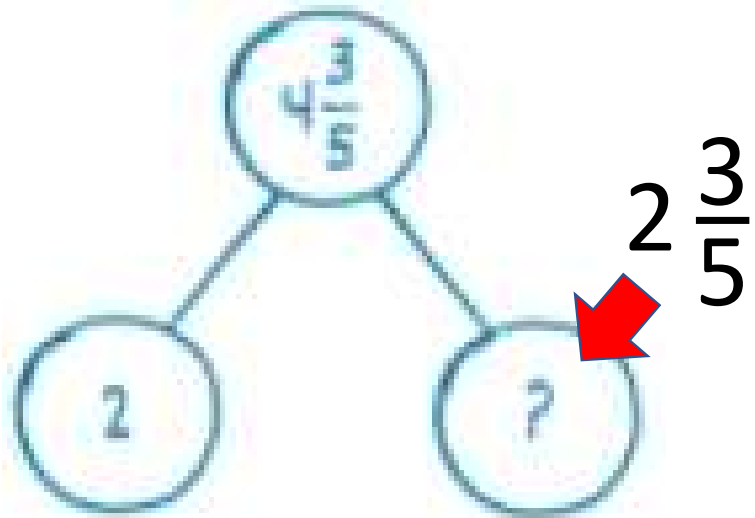
**Subtracting with mixed numbers.**

**How are these expressions alike?**
**How are they different?**

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

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

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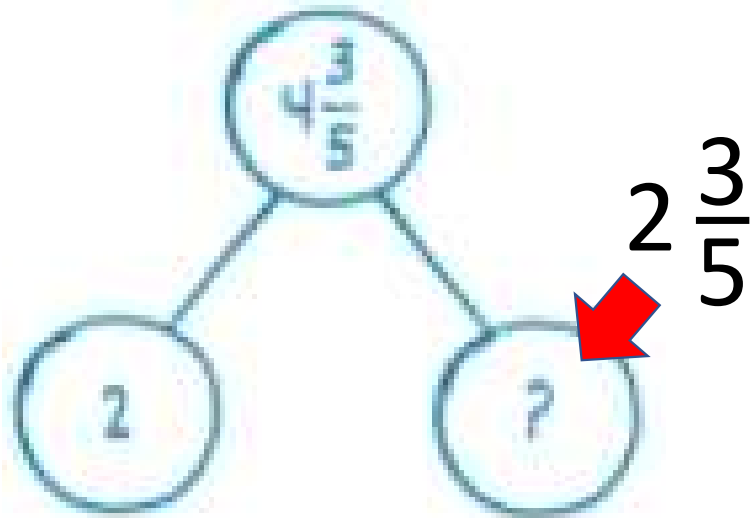| This shows a WHOLE number being subtracted from a MIXED NUMBER. | This shows a MIXED NUMBER being subtracted from a WHOLE number. |
| --- | --- |



$$2\frac{3}{5}$$

$$2\frac{1}{4}$$

**Subtracting with mixed numbers.**

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

On this side we can simply subtract 2 from 4 and be left with 2 3/5. Or simply add 2 to 2 3/5 to get 4.
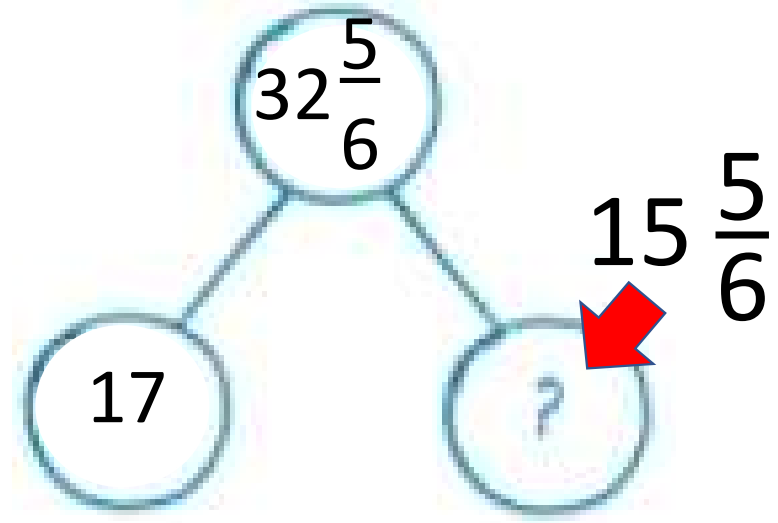
This problem can be easily done using <u>MENTAL MATH</u>.

$$32\frac{5}{6} - 17$$

Can we use mental math for this problem?

Maybe. All we have do is **32 – 17** and add 5/6 to the difference.



$2\frac{3}{5}$



$15\frac{5}{6}$
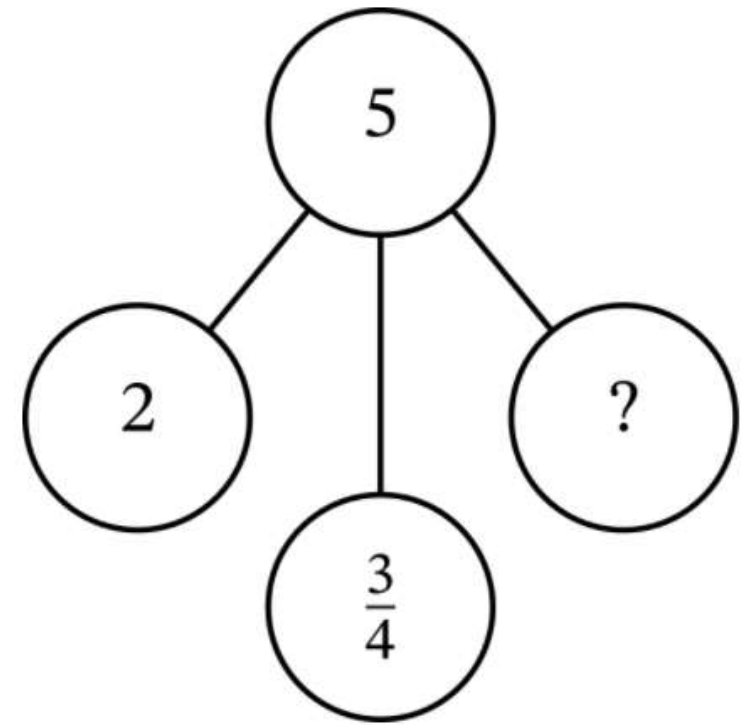
Subtracting with mixed numbers.

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

Looking at this problem, can we use the same method of MENTAL MATH to find the difference as we did in the last expression? Can we simply do 5 – 2?

No! Because now we are taking away a mixed number.

Since this is a different problem, let's try a different method to subtract.

What do you notice about this number bond? Is anything DECOMOSED?



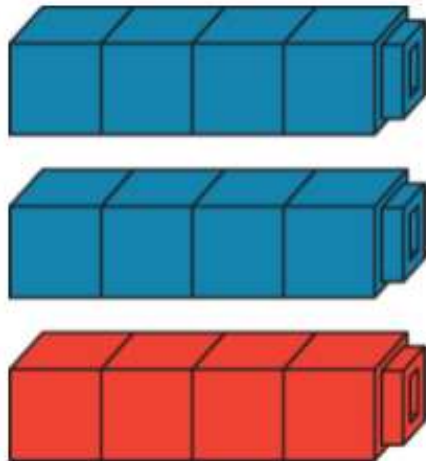Which parts would you subtract first?    5 - 2 = 3

What is left to subtract?    3 - ¾

Let's use Unifix cubes to show 3 – ¾.

**Subtracting with mixed numbers.**

$$3 - \frac{3}{4}$$

$$5 - 2 = 3$$

$$3 - \frac{3}{4} = 2\frac{1}{4}$$

2     $\frac{4}{4}$

$$\frac{4}{4} - \frac{3}{4} = \frac{1}{4}$$

$$2 + \frac{1}{4} = 2\frac{1}{4}$$

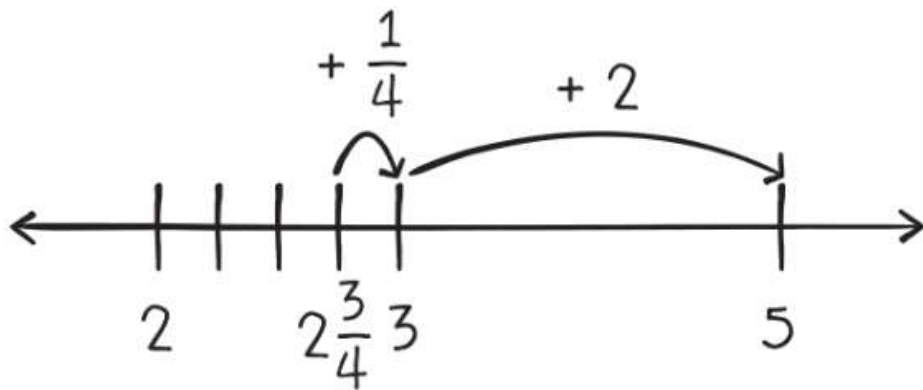**Why did we use 4/4 when we decomposed the 3?**

**Our answer is 2 ¼**

**What do you notice about how these Unifix cubes are composed?**
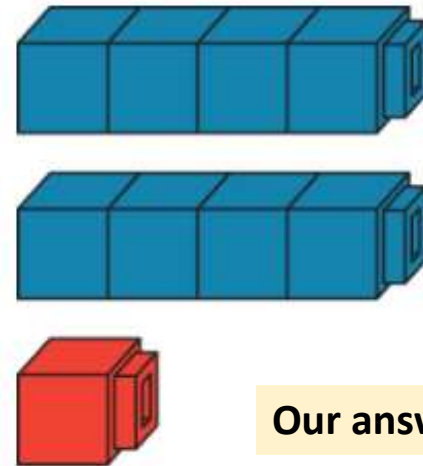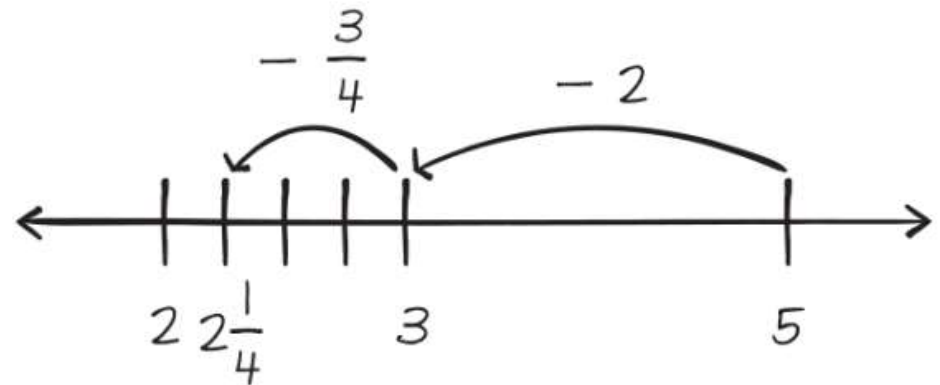
**Subtracting with mixed numbers.**

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

**Riley's Work**



$$2\frac{3}{4} + 2\frac{1}{4} = 5$$

**Leo's Work**



$$5 - 2\frac{3}{4} = 2\frac{1}{4}$$

## LEARN BOOK PAGE 105  - Let's Practice!

$28\frac{5}{7} - 6 = $ _____

$7 - 3\frac{2}{7} = $ _____

$15 - 6\frac{3}{8} = $ _____

**We can simply subtract 6 from 28 and be left with 22 5/7.**

**This problem can be easily done using MENTAL MATH.**

**First, subtract the WHOLE numbers. Next, Rewrite a simpler subtraction problem.**

**First, subtract the WHOLE numbers. Next, Rewrite a simpler subtraction problem.**

28 – 6 = 22

7 – 3 = 4

15 – 6 = 9

22 + 5/7 = **22 5/7**

4 – 2/7

9 – 3/8

**Decompose the 4 into  3 and 7/7**

**Decompose the 9 into 8 and 8/8**

3 7/7 – 2/7  = **3 5/7**

8 8/8 – 3/8  = **8 5/8**

**Exit Ticket**

TEACHER
HELP

QUICK
CHECK

GOOD
TO GO

✉ **12**

Exit Ticket – PAGE 111

**Small Group Time:**
Problem Set Pages 109

**Homework:**
Page 81   APPLY BOOK *(Use page 109 of Learn instead)*

Subtract.

1.  $7\frac{3}{8} - 2 =$ _____

2.  $7 - 2\frac{3}{8} =$ _____

3.  $22 - 4\frac{2}{5} =$ _____