November 16, 2015 TPA Lesson 3.4 Extension

Learning Objective: Students will be able to factor numerical and algebraic expressions.

Warm Up

Find the value of each expression in lowest terms.

$$1. \ 3 \div \frac{17}{4} \div \frac{18}{5}$$

4.
$$2 \div \left(\frac{12}{7} \div \frac{20}{3}\right)$$
 7. $\frac{19}{7} \div \frac{1}{3} \div \frac{5}{3}$

7.
$$\frac{19}{7} \div \frac{1}{3} \div \frac{5}{3}$$

$$2. \ \frac{1}{2} \div \frac{2}{7} \div 11$$

$$5. \ \frac{4}{5} \div \left(\frac{7}{5} \div 10\right)$$

8.
$$4 \div \frac{9}{2} \div \frac{17}{6}$$

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Warm Up Answers

Find the value of each expression in lowest terms.

1.
$$3 \div \frac{17}{4} \div \frac{18}{5}$$

$$= \frac{10}{51}$$

4.
$$2 \div \left(\frac{12}{7} \div \frac{20}{3}\right)$$

$$= \frac{70}{9} = 7\frac{7}{9}$$
7. $\frac{19}{7} \div \frac{1}{3} \div \frac{5}{3}$

$$= \frac{171}{35} = 4\frac{31}{35}$$

7.
$$\frac{19}{7} \div \frac{1}{3} \div \frac{5}{3} = \frac{171}{35} = 4\frac{31}{35}$$

$$2. \frac{1}{2} \div \frac{2}{7} \div 11$$

$$= \frac{7}{44}$$

5.
$$\frac{4}{5} \div \left(\frac{7}{5} \div 10\right)$$

$$= \frac{40}{7} = 5\frac{5}{7}$$

$$8. \ 4 \div \frac{9}{2} \div \frac{17}{6} \\
= \frac{16}{51}$$

Homework Answers

3.4 Record and Practice Journal

Use the Distributive Property and mental math to find the product.

- 1. 4 × 31
- 2. 7 × 49
- 3. 16(38)

124

343

608

Use the Distributive Property to simplify the expression.

- 4. 8(5 + w)
- 5. 11(9+d)
- 6. 15(p-4+2)

- 40 + 8w 99 + 11d
- 15p 30

Simplify the expression.

- 7. 2x 4 + 3x 8. 4y 1 3y + 2 9. x + 2(x 4)

- 5x 4 y + 1 3x 8
- 10. A jazz band sells 31 large boxes of fruit and 74 small boxes of fruit for a fundraiser.
 - a. Use the Distributive Property to write and simplify an expression for the profit.



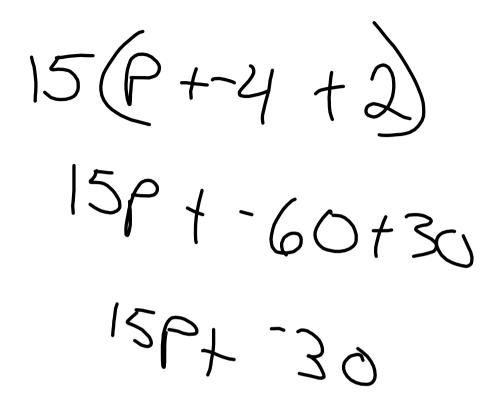


$$31(20 - x) + 74(10 - y);$$

 $1360 - 31x - 74y$

- Profit = Price Cost
- b. A large box of fruit costs \$9 and a small box of fruit costs \$4. What is the jazz band's profit?

\$785



Good thing -> Good Person = + Bad thing > Good Person = Good Thing > Bad Person = Bad Thing -> Bad Person = +

teps + Add + Sub Dentify operation
if add move to step 3
if sub move to step 2 (2) Change to add a change to appropriate of 214#

(3) if Sijis are samp: add absolute values Keep SIM b if signs diff: find difference of A.V. keep sign of higher A.V.

Lesson 3.4 Extension

Lesson Objective:

Students will be able to:

factor numerical and algebraic expressions.

Self-Evaluation Scale

Score	Description
4	I can teach other students how to factor numerical and algebraic expressions.
3	I can factor numerical and algebraic expressions.
2	I recognize, but still need help to factor numerical and algebraic expressions.
1	I do not know how to factor numerical and algebraic expressions.



Factoring an Expression

Writing a numerical expression or algebraic expression as a product of factors is called **factoring the expression**. You can use the Distributive Property to factor expressions.

Numbers
$$3 \cdot 7 + 3 \cdot 2 = 3(7 + 2)$$
 Algebra $ab + ac = a(b + c)$
 $3 \cdot 7 - 3 \cdot 2 = 3(7 - 2)$ $ab - ac = a(b - c)$

•
$$7 - 3 \cdot 2 = 3(7 - 2)$$
 $ab - ac = a(b - c)$

1 Factoring a Numerical Expression

Factor 20 - 12 using the GCF.



Find the GCF of 20 and 12 by listing their factors.

Factors of 20: ①,②,④, 5, 10, 20

Factors of 12: ①,②, 3,4, 6, 12

Circle the common factors.

The GCF of 20 and 12 is 4.

Write each term of the expression as a product of the GCF and the remaining factor. Then use the Distributive Property to factor the expression.

$$20 - 12 = 4(5) - 4(3)$$
 Rewrite using GCF.
= $4(5 - 3)$ Distributive Property

Identifying Equivalent Expressions

Which expression is not equivalent to 16x + 24?



(A)
$$2(8x + 12)$$
 (B) $4(4x + 6)$ **(C)** $6(3x + 4)$

B
$$4(4x+6)$$

©
$$6(3x+4)$$

D
$$(2x+3)8$$

Each choice is a product of two factors in which one is a whole number and the other is the sum of two terms. For an expression to be equivalent to 16x + 24, its whole number factor must be a common factor of 16 and 24.

Factors of 16: ①,②,④,8, 16

Circle the common factors.

Factors of 24: (1),(2), 3,(4), 6,(8), 12, 24

The common factors of 16 and 24 are 1, 2, 4, and 8. Because 6 is not a common factor of 16 and 24, Choice C cannot be equivalent to 16x + 24.

Check:
$$6(3x + 4) = 6(3x) + 6(4) = 18x + 24 \neq 16x + 24$$

So, the correct answer is **C**.



3 Factoring an Algebraic Expression

You receive a discount on each book you buy for your electronic reader. The original price of each book is x dollars. You buy 5 books for a total of (5x - 15) dollars. Factor the expression. What can you conclude about the discount?

Find the GCF of 5x and 15 by writing their prime factorizations.



$$5x = 5 \cdot x$$

 $15 = 5 \cdot 3$ Circle the common prime factor.

So, the GCF of 5x and 15 is 5. Use the GCF to factor the expression.

$$5x - 15 = 5(x) - 5(3)$$
 Rewrite using GCF.
= $5(x - 3)$ Distributive Property

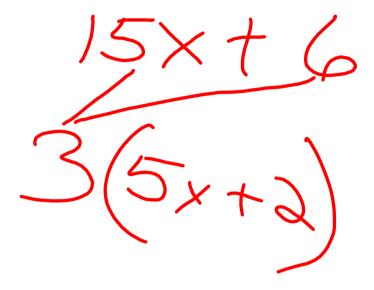
The factor 5 represents the number of books purchased. The factor (x - 3) represents the price of each book. This factor is a difference of two terms, showing that the price x of each book is decreased by \$3.

So, the factored expression shows a \$3 discount for every book you buy. The original expression shows a total savings of \$15.

Assignment

Complete problems 2, 6, 8, 10, 12, 14, 16, 18, & 19 on page 141 in your Big Ideas Text Book.

44-11



Assignment Answers

2.
$$11(4-1)$$

4.
$$5(14 + 19)$$

6.
$$20(5-4)$$

8.
$$16(3+5)$$

10.
$$3(5x + 2)$$

12.
$$10(5x-6)$$

14.
$$14(x-7)$$

2.
$$11(4-1)$$
 16. $8(3y+11x)$

18. Sample answer:
$$16 + 8x$$
, $8(x + 2)$, $4(2x + 4)$, $2(4x + 8)$, $(4x + 8)2$

19.
$$(x + 4)$$
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Homework

In your Big Ideas Record and Practice Journal page 73 & 74.