

Name _____

Date _____

Identifying Equivalent Expressions Step-by-Step Lesson

Problem type 1: Which of the expressions is equal to: $2(4x - 16)$

a) $8x - 30$

b) $4x - 32$

c) $8x - 32$

d) $x - 32$

Explanation:

Notice that the 2 is outside of the brackets. This indicates that we can

Multiply to extend the expression. Let's multiply it out and see what we get:

$$2(4x - 16) = (2 * 4)x - (2 * 16) = 8x - 32$$

This is the same as choice "c".



Problem type 2: Fill in the following missing item:

$$2l - 8m + 14n = 2(l - 4m + \underline{\quad})$$

Explanation:

We can start by extending our the expression on the right.

$$2(l - 4m + \underline{\quad}) = (2 * l) - (2 * 4)m + (2 * \underline{\quad}) = 2l - 8m + 2\underline{\quad}$$

We now set the original expressions equal to each other:

$$2l - 8m + 14n = 2l - 8m + 2\underline{\quad}$$

We can see that the $2l - 8m$ portion of each expression is already equal. We are just concerned about"

$$14n = 2\underline{\quad}$$

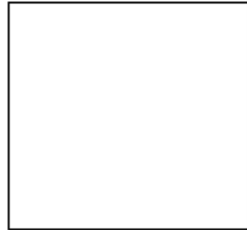
$$\text{Solve for } \underline{\quad}. \quad 14n = 2\underline{\quad} \quad 7n = \underline{\quad}$$



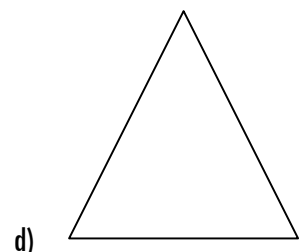
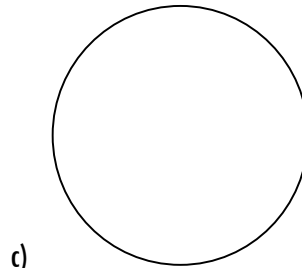
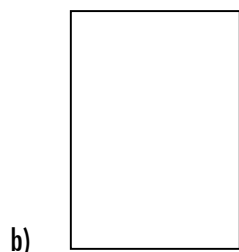
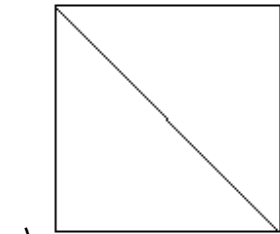
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Equivalent Expressions and Visuals Guided Lesson



1. Which figure is equal to:



2. Find the missing value in the expression so that they are equal.

$$(x + 2)^2 = x^2 + \underline{\quad} + 2 * \underline{\quad} * x$$

3. Write an equivalent expression:

a) $y + 3y - 2y = ?$

b) $12x + 36b = ?$

c) $\frac{x+4x}{5} = ?$



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Equivalent Expressions and Visuals Guided Lesson Explanation

1. We start by comparing the number of sides. The example has 4 sides.

This eliminates c and d. Choice "a" has a diagonal mark that makes it into 2 equilateral triangles. Draw the same mark on the example and choice "b". We can clearly see that only the example and choice "a" make those equilateral triangles. The answer is choice "a".

2. Start by extending the expression on the left.

$$(x + 2)^2 = (x + 2) * (x + 2) = x^2 + 2x + 2x + 4 = x^2 + 4x + 4$$

Now compare what we have on the left to the right:

$$x^2 + 4x + 4 = x^2 + \underline{\quad} + 2 * \underline{\quad} * x$$

$$x^2 + 2^2 + 2 * 2 * x \quad \text{Make them equal.}$$

3. A very easy way to handle of these problems is to just reduce the values. We can do this by combining the values or finding what is common value in the expression.

a) $y + 3y - 2y = 2y$ (Just process the operations.)

b) $12x + 36b = 12(x + 3b)$ (Both variables are divisible by 12.)

c) $\frac{x+4x}{5} = x$ (Just process the operations. $5x/5 = x$)



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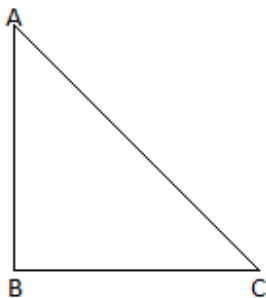
Equivalent Expressions Independent Practice Worksheet 1

1. Which of the expressions is equal to $\frac{x^2 - y^2}{x - y}$

- a) $x - y$ b) $x + y$ c) xy d) x/y

2. Complete the below expression to make them equal: $\frac{x^2 - y^2}{x + y} = \frac{[(\quad)(x - y)]}{x + y}$

3. If we have given the below triangle



Then *Area of $\triangle ABC$* is equal to which of the expressions?

- a) $\frac{1}{2} * AB * BC$ b) $\frac{1}{2} * AC * BC$ c) $\frac{1}{2} * AB * AC$ d) $2AC * BC$

4. Draw lines to match the equivalent expressions.

- | | |
|----------------|-----------|
| $2(a - 3)$ | 12 |
| $4b * 9$ | $-6x$ |
| $x(3 - 9)$ | $2a - 6$ |
| $12(2 \div 2)$ | $9 * 4b$ |
| $3(x - y)$ | $3x - 3y$ |



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Equivalent Expressions Independent Practice Worksheet 2

1. Which of the following expressions is equal to $(3(x^2 - 6x + 9))$

a) $3(x^2 - 6x - 9)$ b) $3(x - 3)^2$

c) $3(x + 3)^2$ d) $3(x^2 - 3)^2$

2. Which of the following expressions is equal to $(\frac{1}{2} + \frac{6}{7})$

a) $(\frac{6}{7} + \frac{1}{2})$ b) $2/14$

c) $\frac{12}{14}$ d) $(\frac{2}{14} + \frac{1}{14})$

3. Which of the following expressions is equal to $(\frac{1}{2} + \frac{6}{7}) + \frac{4}{7}$

a) $(\frac{6}{7} + \frac{1}{2}) + \frac{2}{7}$ b) $2/14$

c) $\frac{12}{14}$ d) $\frac{1}{2} + (\frac{6}{7} + \frac{4}{7})$

4. Which of the following expressions is equal to $(\frac{1}{2} * \frac{6}{7} * \frac{7}{3} * \frac{8}{4})$

a) 1 b) 2

c) 3 d) 4

5. Find the missing value in the expression so that they will be equal.

$$(x + \underline{\quad})^2 = x^2 + 9 + 2 * 3 * x$$

6. Find the missing value in the expression so that they will be equal.

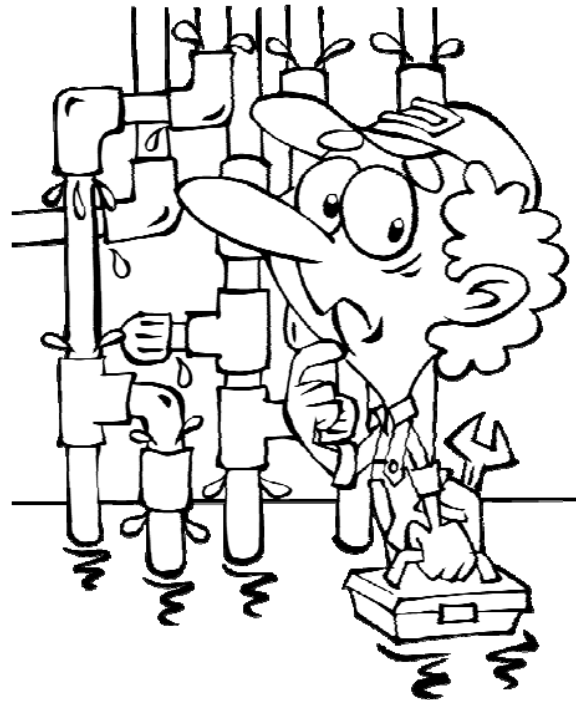
$$(x - \underline{\quad})^2 = x^2 + 16 - 2 * 4 * x$$

7. Find the missing value in the expression so that they will be equal.

$$(x - 5)^2 = x^2 + \underline{\quad} - 2 * 5 * x$$

8. Find the missing value in the expression so that they will be equal.

$$(x + 3)^3 = x^3 + 27 + 9x(\underline{\quad} + \underline{\quad})$$



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Equivalent Expressions Independent Practice Worksheet 2

Answer key:

1. b

2. a

3. d

4. b

5. $(x + 3)^2 = x^2 + 9 + 2 * 3 * x$

6. $(x - 4)^2 = x^2 + 16 - 2 * 4 * x$

7. $(x - 5)^2 = x^2 + 25 - 2 * 5 * x$

8. $(x + 3)^3 = x^3 + 27 + 9x(x + 3)$

