

LIVEWORKSHEET



MATHEMATIC

ALGEBRA FORM

GRADE 7

Nama

Kelas

No. Absen

LIVEWORKSHEET

Status Pendidikan : SMP/MTS

Sub Materi : Perkalian dan Pembagian Bentuk Aljabar

Alokasi Waktu : 2 x 30 menit

Kompetensi Dasar

3.7 Menjelaskan dan melakukan operasi pada bentuk aljabar (perkalian dan pembagian)

4.7 Menyelesaikan masalah berkaitan dengan operasi pada bentuk aljabar

Indikator Pembelajaran

- Memahami operasi hitung perkalian bentuk aljabar
- Terampilan dalam menghitung operasi hitung perkalian bentuk aljabar

Petunjuk :

1. Silahkan perhatikan video yang ada
2. Baca setiap petunjuk yang terdapat pada LKPD
3. Pahami setiap materi yang disajikan, dan ditanyakan apabila ada bagian yang tidak mengerti

MULTIPLICATION AND DIVISION OF ALGEBRAIC EXPRESSIONS

Let's watch the learning video about the multiplication of algebraic expressions!

Examples of the results of multiplying a monomial by a binomial:

$$\begin{array}{c} \textcircled{2} \quad \textcircled{1} \quad \textcircled{2} \\ 4(a - 3b) = 4(a) + 4(-3b) \\ \quad \quad \quad = 4a - 12b \\ \textcircled{1} \end{array}$$

$$\begin{array}{c} \textcircled{2} \quad \textcircled{1} \quad \textcircled{2} \\ 3xy(x - 5) = 3xy(x) + 3xy(-5) \\ \quad \quad \quad = 3x^2y - 15xy \\ \textcircled{1} \end{array}$$

$$\begin{array}{c} \textcircled{2} \quad \textcircled{1} \quad \textcircled{2} \\ 3(7a + 2) = 3(7a) + 3(2) \\ \quad \quad \quad = 21a + 6 \\ \textcircled{1} \end{array}$$

After watching the video above, solve the problems below!

1. $5 \times x =$ _____
2. $3(2a) =$ _____
3. $a(7b) =$ _____
4. $5(x + 10) =$ _____ $=$ _____
5. $7(2x + 3) =$ _____ $=$ _____
6. $8(2p - 5q) =$ _____ $=$ _____

Let's watch the learning video about the multiplication of algebraic expressions!

After watching the learning video, work on the following problems by finding the correct answers.

The general form of multiplying a binomial by a binomial.

$$\begin{aligned}
 (ax + b)(cx + d) &= ax(cx) + ax(d) + b(cx) + b(d) \\
 &= acx^2 + adx + bcx + bd \\
 &= acx^2 + (ad + bc)x + bd
 \end{aligned}$$

1. $2a(-4a - 2b) =$ _____

$5p(2p) + 5p(-3q) - q(2p) - q(-3q)$

$2a(-4a) + 2a(-2b)$

2. $(a - 6)(a + 3) =$ _____

$10x(x) + 10x(4) + 2(x) + 2(4)$

$a^2 + 3a - 6a - 18$

3. $(10x + 2)(x + 4) =$ _____

$10p^2 - 17pq + 3q^2$

$a(a) + a(3) - 6(a) - 6(3)$

$10p^2 - 15pq - 2pq + 3q^2$

4. $(a + 7b)(5a - 3b) =$ _____

$a(5a) + a(-3b) + 7b(5a) + 7b(-3b)$

$5a^2 + 32ab - 21b^2$

$10x^2 + 42x + 8$

5. $(5p - q)(2p - 3q) =$ _____

$10x^2 + 40x + 2x + 8$

$-8a^2 - 4ab$

$a^2 - 3a - 18$

$5a^2 - 3ab + 35ab - 21b^2$

Let's observe the learning video about the division of algebraic expressions below!



Recall the rules for dividing algebraic expressions:

$$1. \frac{p^5}{p^3} = \frac{p \times p \times p \times p \times p}{p \times p \times p} = p^2$$

$$2. \frac{12m^6}{4m^2} = \frac{12 \times m \times m \times m \times m \times m \times m}{4 \times m \times m} = 3m^4$$

$$3. \frac{6x+8}{2} = \frac{6x}{2} + \frac{8}{2} = 3x + 4$$

$$4. \begin{array}{r} \times 2 \quad \times 4 \\ x+2 \overline{) x^2 + 7x + 10} = x + 5 \\ \underline{x^2 + 2x} \\ 5x + 10 \\ \underline{5x + 10} \\ 0 \end{array} \quad \begin{array}{l} \text{①} \\ \text{②} \\ \text{③} \end{array} \quad \text{(Then divide again by } x + 2 \text{)}$$

Work on the following problems correctly.

$$1. \frac{10a^2}{5a} = \frac{\dots\dots\dots}{\dots\dots\dots} = \dots\dots\dots$$

$$2. \frac{10y-25}{5} = \frac{\dots\dots\dots}{\dots\dots\dots} - \frac{\dots\dots\dots}{\dots\dots\dots} = \dots\dots\dots$$

$$3. \frac{7a^3+21a}{7a} = \frac{\dots\dots\dots}{\dots\dots\dots} - \frac{\dots\dots\dots}{\dots\dots\dots} = \dots\dots\dots$$

$$4. a - 3 \sqrt{4a^2 - 10a - 6} =$$

$$\begin{array}{r} \dots \quad 2 \quad \dots \\ \dots \quad \dots \quad \dots \\ \dots \quad \dots \quad \dots \\ \dots \quad \dots \quad \dots \end{array}$$

$$5. x + 2 \sqrt{2x^2 - x - 10} =$$

$$\begin{array}{r} \dots \quad 2 \quad \dots \\ \dots \quad \dots \quad \dots \\ \dots \quad \dots \quad \dots \end{array}$$

KEGIATAN 3

Petunjuk :

1. Buatlah kelompok yang terdiri dari 4 orang
2. Tuliskan nama kelompok pada tempat yang telah disediakan
3. Kerjakanlah sesuai perintah dan jawab setiap pertanyaan
4. Jika terdapat pertanyaan belum jelas, silahkan bertanya kepada guru

Nama Kelompok :

Amatilah video berikut ini, sebelum menyelesaikan persoalan di bawah ini

Mr. Bima owns a rice field that is rectangular in shape, with a length of $(4x + 2)$ cm and a width of $(2x + 1)$ cm. Express the area of Mr. Bima's rice field in algebraic form.

Jawab :

Penyelesaian:

$$\text{Luas} = \dots \times \dots$$

$$= (\dots)(\dots)$$

$$= \dots^2 + \dots + \dots + \dots$$

$$= \dots^2 + \dots + \dots$$

Let's observe the learning video about the division of algebraic expressions below!

If the area of Mrs. Caca's kitchen tiles, which are rectangular in shape, is $x^2 + 4x - 12 \text{ cm}^2$, determine the width of the tiles if the length of the tiles is $x + 6$.

Solution: ∴

Area of a Rectangle = ×

$$\begin{aligned}
 x^2 + 4x - 12 &= (\quad \quad \quad) \times (\quad \quad \quad) \\
 &= \frac{x^2 + 4x - 12}{x + 6} \\
 &= \frac{(x + 6)(x - 2)}{x + 6} \\
 &= x - 2 \text{ cm}
 \end{aligned}$$

CONCLUSION

Based on the exercises above, how is the procedure for multiplication and division of algebraic expressions?