A and G 1. Class work 14.

Algebra.

Algebraic identities.

Identities are equalities which are true for any (possible) values of variables.

$(a+b)^2 = (a+b)(a+b) = a^2 + ab + ba + b^2 = a^2 + 2ab + b^2$

$(a+b)(a-b) = a^2 - ab + ba - b^2 = a^2 - b^2$

$(a+b)^3 =$

$(a+b+c)^2 =$

Factorization of a polynomial is a representation of the polynomial as a product of a monomial and polynomial or a product of two ore more polynomials.

For example,

$6x^2y - 3y^2x = 3xy(2x - y)$

$2a^4 + 2a^3x^2 + xa + x^3 = 2a^3(a + x^2) + x(a + x^2) = (a + x^2)(2a^3 + x)$

Exercises.

1. Simplify the following expressions:

   $a.\ 7a + (2a + 3b);$ $b.\ 9x + (2y - 5x);$
   $c.\ (5x + 7a) + 4x;$ $d.\ (5x - 7a) + 5a;$
   $e.\ (3x - 6y) - 4y;$ $f.\ (2a + 5b) - 7b;$
   $g.\ 3m - (5n + 2m);$ $h.\ 6p - (5p - 3a);$

2.
   $a.\ (x^2 + 4x) + (x^2 - x + 1) - (x^2 - x);$
   $b.\ (a^5 + 5a^2 + 3a - a) - (a^3 - 3a^2 + a);$
   $c.\ (x^2 - 3x + 2) - (-2x - 3);$
   $d.\ (abc + 1) + (-1 - abc);$

   .

3. Multiply polynomials.

   $a.\ (a + 2)(a + 2);$ $f.\ (a + 1)(a + 3);$
   $b.\ (3 + y)(y + 4);$ $g.\ (c + d)(c - 2d);$
   $c.\ (3 + x)(3 - x);$ $h.\ (y - 2)(3 - y);$
   $d.\ (x - y)(x + y);$ $i.\ (x - m)(x - m);$
   $e.\ (2a + c)(a + ac);$ $j.\ (2d + 3l)(2d + 3l);$

4. Factorize the following polynomials:

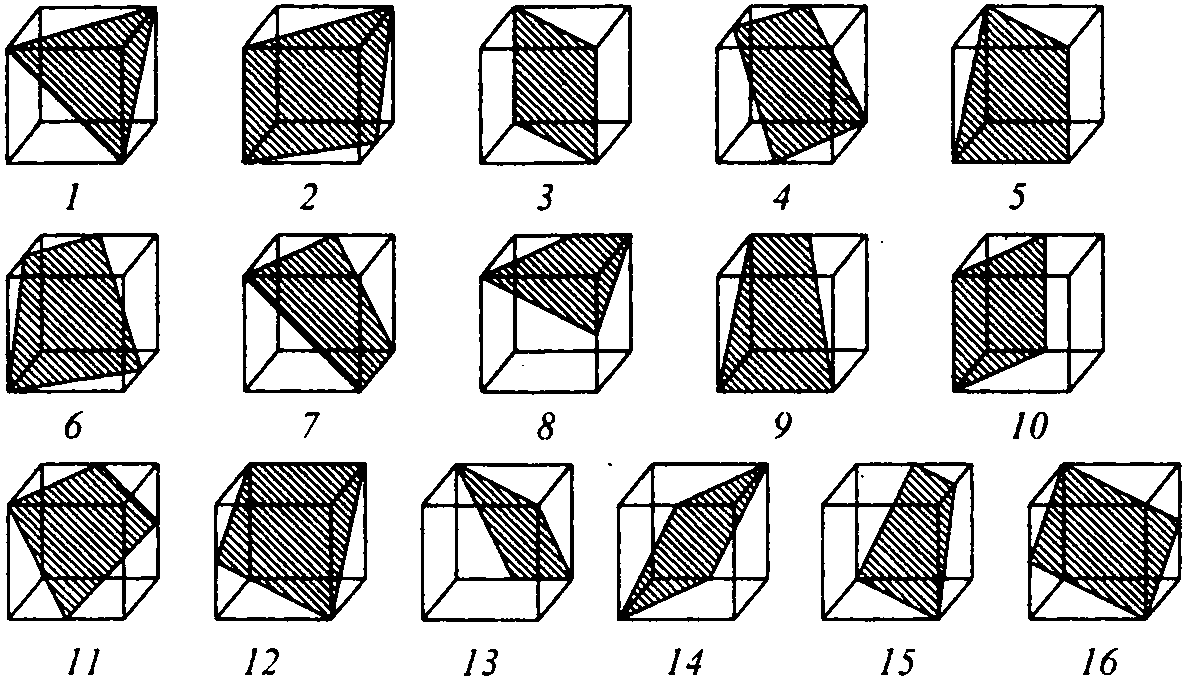
   $a.\ x(1 + b) + y(1 + b);$ $f.\ (a + b)a - b(a + b);$
   $b.\ m(2k - 3) + 2(2k - 3);$ $g.\ (x + y)3 - a(x + y);$
   $c.\ 2a(1 - b) - 3(1 - b);$ $h.\ a(b + 3) - b(3 + b);$
   $d.\ 7x(x - 2y) - 2(2y + x);$ $i.\ a(a + b) + (a + b);$
   $e.\ 2x(x - 2y) + 3y(x + 2y);$ $j.\ 2x(a - 1) - (a - 1);$

5. Add fractions:
   Example:
   $$\frac{2}{x^2a}+\frac{3}{a^2x}=\frac{2a}{a^2x^2}+\frac{3x}{a^2x^2}=\frac{2a+3x}{a^2x^2}$$

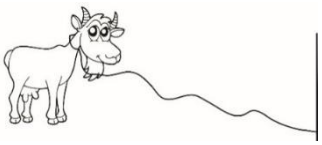
   $a.\ \frac{1}{a}+\frac{1}{b};$ $b.\ \frac{2}{x}-\frac{3}{y};$ $c.\frac{x}{a}+\frac{y}{b};$

   $d.\ \frac{5a}{7}-\frac{b}{x};$ $b.\ \frac{1}{2a}-\frac{1}{3};$ $c.\frac{1}{a}-\frac{1}{bc};$

6. A goose flying in the sky met a flock of geese. “Hi, one hundred geese” he said. “No, we are not 100 geese” answered the oldest goose from the flock. “the number , and number of us, and half of the number, and a quoter of the number, together with you will make exactly 100 geese”. How many geese were in the flock?

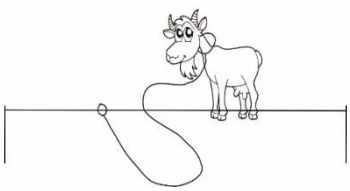


7.



8.

- A goat is tied to a stake with a rope that is L meters long. What shape will it graze?



- A goat is tied to 2 poles with a rope that is L meters long. What shape will it graze?