



The turn of the school year brings the depressing side of school life—exams. The pupils' profiles take on deep wrinkles from excessive study, and the midnight oil burns far into the night. Thus, well prepared, we bravely and hopefully take up our pens.

WITHEROW HIGH SCHOOL
ALGEBRA III JANUARY, 1947

GROUP I (Take all)

1. Simplify

$$\frac{(2a - \frac{a^2 - b^2}{a})(3b + \frac{a^2 + b^2}{b})}{(\frac{a^2}{b} + 5 + \frac{4b^2}{a^2})}$$

2. $\frac{4x + 3a}{x + 2a} + \frac{4x - 5a}{3a - x} = \frac{10a^2}{x^2 - ax - 6a^2}$

3. (a) Simplify $25^0 + .65^{\frac{1}{2}} - (2^{\frac{3}{4}} + 4^{-\frac{1}{2}}) + .027^{\frac{1}{3}}$

(b) $2\sqrt{12} - 3(27)^{\frac{1}{3}} + 9\sqrt{\frac{16}{3}} - 2(100)^{\frac{1}{2}}$

(c) Change $\frac{2\sqrt{3} - \sqrt{6}}{2\sqrt{3} + \sqrt{6}}$ to a fraction in which the denominator contains no fractions. Find its numerical value. $\sqrt{3} = 1.732$, $\sqrt{6} = 2.436$.

4. Solve by completing the square or by formula

$$\frac{x+7}{2x^2-7x+3} + \frac{x}{x^2-2x-3} - \frac{x+3}{1-x-2x^2} = 0$$

5. Solve for x and y $x^2 + 4xy = 57$
 $x + y = 7$

GROUP II (Take two)

6. (a) If it takes 3 men 21 days to do a piece of work, how long will it take 6 men to do it?
(b) Separate a line 58 inches long into two parts which have the ratio of 3 to 4.

7. A man builds a coal bin which holds 9 tons of coal. The bin is 6 ft. deep and 4 ft. longer than it is wide. Allowing 40 cubic feet to the ton, what are the dimensions of the bin?

8. A corner building lot, rectangular in shape, contained 9600 square feet. After a sidewalk 6 ft. wide had been built on one side and the front the area of the lot was reduced to 8216

Group I

$$\frac{(2a - \frac{a^2 - b^2}{a})(3b + \frac{a^2 + b^2}{b})}{(\frac{a^2}{b} + 5 + \frac{4b^2}{a^2})} = \frac{(2a - \frac{a^2 - b^2}{a})(3b + \frac{a^2 + b^2}{b})}{(\frac{a^2 + 5ab + 4b^2}{a^2})}$$

$$\frac{(2a - \frac{a^2 - b^2}{a})(3b + \frac{a^2 + b^2}{b})}{(\frac{a^2 + 5ab + 4b^2}{a^2})} = \frac{(2a - \frac{a^2 - b^2}{a})(3b + \frac{a^2 + b^2}{b})}{(\frac{a^2 + 5ab + 4b^2}{a^2})} \times \frac{a^2}{a^2}$$

Answer ab

$$2. \frac{4x+3a}{x+2a} + \frac{4x-5a}{3a-x} = \frac{10a^2}{x^2-ax-6a^2}$$

$$\frac{4x+3a}{x+2a} - \frac{4x-5a}{x-3a} = \frac{10a^2}{(x-3a)(x+2a)}$$

$$(4x+3a)(x-3a) - (x+2a)(4x-5a) = 10a^2$$

$$4x^2 - 9ax - 9a^2 - 4x^2 + 3ax + 10a^2 = 10a^2$$

$$-12ax = 9a^2$$

$$x = \frac{3a}{4}$$

