8. If a, b be integers, and $\dfrac{a}{b} = \dfrac{3}{4}$, then a is a multiple of 3, and b is the same multiple of 4.

4. (1). Simplify. $\sqrt{x^2-y^2}\,\sqrt{x^3+y^3}\,\sqrt{x^3-y^3}\,\sqrt{x^4+x^2y^2+y^4}.$ $= x^6 - y^6$

(2). Extract the square root of
$$\frac{x^2}{9y^2} + \frac{2x}{3y} + \frac{11}{9} + \frac{2y}{3x} + \frac{y^2}{9x^2} = \frac{y}{3y} + 1 + \frac{y}{3x}$$

5. Solve the equations

(1). $x + \dfrac{24}{8x+1} = 2x - 3\frac{1}{2}.$ $5 \ or \ 1\frac{5}{6}$

(2). $6x + \sqrt{x} = 2.$ $= \frac{4}{9} \ or - \frac{1}{4}$

6. Solve the equations

(1). $x - y = 3$, $xy = 18.$ $y = 6 \ or - 3, y = 3 \ or - 6$

(2). $x^2 - xy = 3$, $x^2 - y^2 = 5.$ $x = \pm 3 \ y = \pm 2$

(3). $x - y = a$, $y - z = b$, $z + x = c.$ $x = \frac{a + c - b}{2} \ y = b + c - a \ 3 = $

7. (1). Solve the equation $ax^2 + bx + c = 0$, and interpret your result according as $a = 0$, or $b = 0$, or $a = b = 0$. $a = 0 \ then \ x = \frac{b^2 - 4ac}{2a}$

(2). If $a + b + c = 0$, find values of x that will satisfy
$$\frac{a}{x+b} + \frac{b}{x+c} + \frac{c}{x+d} = 0. \quad x = \frac{acd + b^2d - abc}{ad + bd - ab}$$

8. If a, β be roots of $ax^2 + bx + c = 0$, and $a + \beta$, $a - \beta$ roots of $a'x^2 + b'x + c' = 0$, show that $ab'^2 - 2a'bb' + 4a'^2c = 0.$

9. The sides of a box are all rectangles, and the areas of the unequal sides are $7\frac{1}{2}$, 15 and $4\frac{1}{2}$. Find the lengths of the sides. $5, 3 \ and \ 1\frac{1}{2} \ inches$

Special Articles.

"A COLLEGE FETICH." *

BY DAVID ALLISON, LL.D.

The author of this address cherished "a purpose." He "had something which 'he' much wanted to say." He came before his hearers—the Phi Beta Kappa Chapter of Harvard University—with "a message," and assuredly no lack of intense expression and moral enthusiasm characterizes this message.

The "College Fetich" is the deference still paid to classical studies in the chief universities of the United States, and by a natural consequence in the academical institutions which supply those colleges with students. The prevailing system of education in the leading New England University is represented and attacked by one of its most famous graduates as "a superstition."

I am strongly of the opinion that the address owes its chief value to the stirring tones in which it calls attention to pending educational problems of great moment, rather than to any special contribution made by it to the solution of those problems.

In the first place the historical argument—the appeal to facts—which runs through a considerable portion of the address seems to me to completely break down ; or if not that, to prove a conclusion too insignificant to be taken into account in an important educational controversy. Mr. Adams, with all his well-developed pride of ancestry, undertakes to illustrate from the history of his own family the folly of making classical study the back-bone of academic and college curricula. How does he illustrate this? Four generations of Adamses have graduated at Harvard, Mr. Adams himself representing the fourth. He graduated in 1856 ; his great-grandfather, John Adams, in 1755. That great-grandfather played a leading part in a mighty revolution, became first, Vice-President, and then President, of the United States, and died on the anniversary of his country's independence one of the most conspicuous and honored of men. His son, John Quincy Adams, "the old man eloquent" of the American Congress, the steadfast

friend of human freedom, so far overcame the incubus of his classical training as to rise to the same great elevation, the presidency of the United States. The Adams of the third generation, Charles Francis, senior, also contrived to acquire some distinction, particularly as a refined and *educated* statesman. Not to speak of domestic positions of honor and influence, he was chosen to represent his country at a most critical period at the Court of Great Britain, and, again, upon the Board of International Arbitration at Geneva. Mr. Adams speaks modestly of his own achievements, not from pure modesty, perhaps, so much as from a desire to help his argument. Yet we well know that he and his three brothers, who are also Harvard men, have made no little stir in American social and political life ; that they have an unmistakable stamp of scholarship upon them, that they speak well and write well, that they take an interest in useful reforms, and on most subjects reason logically. One is anxious to know how Mr. Adams proposes to press this phenomenal family history—four successive generations keeping themselves in the front and at the top amid the frictions and changes of a hundred and thirty years—into the service of his argument. The "Fetich," and the evil consequences of worshipping it, are not *in sight* to ordinary vision. There is, of course, always more or less uncertainty, and liability to error, in inferring from success in after life the excellence of early methods of instruction. It is always open to the proverbial doubter to say, "Oh, he would have been still more successful had he been educated according to *my* theory." But in the facts of so extended and varied an experience as this before us, we seem to have the basis of a reasonably sure induction. And that induction certainly does not lead us to the "Fetich." What, then, are the counterbalancing facts as yet hidden from us ? As to his *ancestors*. Simply these, that the elder Adams, when acting as representative at Paris of the struggling American colonies, must have found his ignorance of French inconvenient ; while John Quincy and Charles Francis, senior, happily possessing a knowledge of that language, though not obtained at Harvard, were enabled to render their country very effective diplomatic services at the Hague, at Ghent, at Paris, and at Geneva. As for *himself*, Mr. Adams tells us that his *Alma Mater*, bunging him up on Latin and Greek, sent him out "as a cavalry officer into the war of the rebellion equipped with shields and swords and javelins instead of repeating-rifles." When, at the conclusion of the war, he devoted himself to special studies and efforts "in connection with the development of the railroad system," he found himself "incapacitated from properly developing his (my) specialty by the sins of omission and commission incident to his (my) college training." In short, he stands before us "a sacrifice to the Fetich," but by no means does he propose to be "a *silent* sacrifice." A failure, as also his logic requires all his fathers to have been, he is bound to put the responsibility where it properly belongs, "at the door of his (my) preparatory and college education." This appeal to fact must be left to produce its own impression on the reader's mind. But I may draw attention to two points worthy of notice. In the first place, Mr. Adams should know that it is beyond the power of any American University to bestow that *practical use* of the European languages which may have been advantageously possessed by several of his ancestors, while a little inquiry would have convinced him that Harvard now makes admirable provision for teaching the languages of modern Europe, so far as *reading and writing them* are concerned—the only knowledge of them which can be said to be necessary for scientific purposes, such as "the development of railroads." Secondly, he altogether fails to show how he would have been less "a sacrifice to the Fetich" in respect to his "specialty" had the fates compelled him to study *modern* rather than *classical* literature. Modern