6. A vessel steaming at the rate of 11 knots (each 2,000 yards) an hour, fires a gun for her consort. The report is heard by the crew of the latter vessel 12 seconds after the flash is seen. At what rate (miles per hour) must they steam to overtake the first vessel in 3 hours if sound travels 1100 feet per second?

7. A merchant sold 88 yards of different kinds of cloth for $198.00. The prices per yard were $1·75, $1.90, $2.50, $3.00. Find the number of yards of each kind of cloth sold.

8. How many square feet of lumber will it take to cover the gable of a barn 56 feet wide, if its height above the level of the eaves is 14⅔ feet?

9. Find the convex surface and the entire surface of a cone, the slant height of which is 24 inches, and the diameter of the base 20 inches.

ALGEBRA.

SENIOR FIFTH BOOK.

1. If $a=1$, $b=-1$, $c=2$, $d=-3$, find the numerical value of $\dfrac{(a-b)(b-c)(c-d)}{(b-a)(c-b)(d-c)}$

2. Simplify $\{(a+b)x+(a-b)y\} - \{(a-b)x-(a-b)y\} + (a+x)(b-y)-(b-y)x$.

3. Find the H. C. F. of $4x^4+9x^3+2x^2-2x-4$, and $3x^3+5x^2-x+2$.

4. Simplify (*a*). $\dfrac{6a^3-22a^2b+12ab^2}{27a^3-27a^2b+6ab^2}$

(*b*). $\dfrac{1}{4ab-a^2-4b^2} - \dfrac{1}{3a^2-7ab+2b^2}$

(*c*). $\left(1+\dfrac{x}{1-x}\right) \times \left(1-\dfrac{x}{1+x}\right) \times \left(1-x^2+\dfrac{1-x^2}{x}\right)$