

SHERBORNE SCHOOL.

CHRISTMAS EXAMINATION, 1895.

Algebra.

Lower School.

1. If $a=3$, $b=4$, $c=5$, $d=6$, find the value of

(1) $a^3 - b^2$;

(2) $4a^3 + 3a^2b^2 - 3c^3$;

(3) $\sqrt{6bd} - \sqrt{b+c}$.

2. Simplify:

(1) $7a - 4b - \{5a - 3[b - 2(a - b)]\}$;

(2) $5(a+b)^3 + 5(a-b)^3 + 20ab(a-b) - 10a(a+b)^2$.

3. Multiply together:

(1) $2x - 5$, $3x + 2$;

(2) $x + 1$, $x + 2$, $x - 1$, $x - 2$;

(3) $x^3 - 5x^2 - 3x - 18$, $x^2 + 3x - 4$.

4. Subtract the sum of $3a - 2b$ and $2b + 3c$ from

$$5a - b + 2c.$$

Add together

$$1 - (1 - 1 - x), \quad 2x - (3 - 5x), \quad 2 - (-4 + 5x).$$

5. How many pence are there in y shillings and x pounds?

The sum of two numbers is $p + q$; if one of them is x , what is the other?

6. Divide:

(1) $x^2 + 7x + 12$ by $x + 3$;

(2) $3a^2 + a + 9a^3 - 1$ by $3a - 1$;

(3) $3x^4 - 10x^3y + 22x^2y^2 - 22xy^3 + 15y^4$
by $x^2 - 2xy + 3y^2$.

7. Solve the equations:

(1) $4x - 22 = 34 - 3x$;

(2) $3(x - 1) + 2(x - 2) = x - 3$;

(3) $(4x - 3)(3x - 4) - (2x - 1)(6x + 1)$
 $= 3(3 - 5x) - 2$;

(4) $\frac{x-7}{2} - \frac{x+7}{3} + \frac{x}{9} = 0$.

8. Resolve into factors :

$$(1) \ x^2 - x - 12; \quad (2) \ 4x^2 - 1; \quad (3) \ x^3 + y^3.$$

9. Find the H. C. F. of

$$4x^3 + x + 15, \quad 12x^3 + 2x^2 + 50.$$

10. Simplify :

$$(1) \ \frac{x-y}{xy} + \frac{y-z}{yz} + \frac{z-x}{zx};$$

$$(2) \ \frac{2a}{a^2 - b^2} + \frac{1}{a+b} + \frac{1}{b-a}.$$

11. Solve :

$$(1) \ \frac{x}{2} + \frac{y}{3} = 5,$$

$$\frac{x}{3} - \frac{y}{2} = -1;$$

$$(2) \ x^2 - 4x + 3 = 0.$$

12. The number of months in the age of a man on his birthday in the year 1875 was exactly half of the number denoting the year in which he was born. In what year was he born?