

100 Marks. Time—An hour-and-a-half.

All questions to be answered.

1. Simplify :

$$(a) (2x+3)(3x-1) + (2x-5)(5x-3) - (4x-3)^2$$

$$(b) 6\left\{x - \frac{1}{3}(2x-7) + \frac{1}{2}(x-5)\right\} - 5x.$$

What is the difference between the value of (a) and the value of (b) ?

[16 marks.]

2. (a) Find a value of x which makes

$$\left(x + \frac{3}{2}\right)^2 - \left(x - \frac{1}{2}\right)^2 = 2x + 5.$$

Prove your answer.

(b) Show that this is not an identical equation.

[16 marks.]

3. (a) For what value of p is $x^2 - 7x + p$ divisible by $x - 2$?

(b) Show that $15ac + 2bd - 3bc - 10ad$ is divisible by $5a - b$.

(c) Prove that

$$\begin{aligned} & [(x^2 - 6x + 9) \div (x - 3)] + [(y^2 + y - 6) \div (y - 2)] \\ & = [(x^3 + y^3) \div (x^2 - xy + y^2)]. \end{aligned}$$

[17 marks.]

4. (a) When eggs are a pence a score how many can be got for one shilling?

(b) If $\pounds x$ is the simple interest on $\pounds y$ for z years, what is the simple interest on $\pounds a$ for b years at the same rate?

[17 marks.]

5. If it takes a girl 12 minutes longer to walk to school at $2\frac{1}{2}$ miles per hour than to walk home at 3 miles per hour, how far is her home from the school?

[17 marks.]

6. (a) If x , y , and z are consecutive numbers, show that $x^2 + z^2 - 2y^2 = 2$.

(b) Show that the sum of 5 consecutive *even* numbers is divisible by 10.

[17 marks.]