1960

1. What value of x would make
$$6[3\tfrac{1}{2}-\tfrac{1}{3}\{2x-5(x-1)\}+2]=0\ ?$$

2. (*a*) If $a=3$, $b=-2$, and $a+b+c=0$, show that
$$a^3+b^3+c^3=3abc.$$
(*b*) If $5x-y=8$ and $5y-x=20$, find the value of $x+y$ and also of $x-y$.

3. (*a*) Factorize :
(i) x^2-x-6;
(ii) $x^2y^2-x^2-y^2+1$.
(*b*) If $a^2+b^2=x^2+y^2$ show that
$$\frac{a+x}{y+b}=\frac{y-b}{a-x}.$$

4. (*a*) If ·2% of $x-1$ is equal to ·3% of $x-2$, what is the value of x?

(*b*) If x miles per hour is the same as $2(x-8)$ feet per second, what is the value of x?

5. A bill of £1 3s. 3d. is paid in half-crowns and threepenny pieces. If there are 12 coins in all, how many of each are used?

6. (*a*) Has $6x^3+5x^2-3x-2$ any factors other than $x+1$? Give the reason for your answer.

(*b*) If $K(x+1)$ is less than $3(4-5x)$ by 27 for all positive values of x, what value has K?

7. Oranges are bought at x pence a dozen and sold at a profit of 25%. How many are sold for 2s. 6d.? From your answer find the value of x if 144 are sold for £1 2s. 6d.

8. Simplify:

(*a*) $\dfrac{ab-bc}{2bc} - \dfrac{a}{3c} - \dfrac{a^2-ac}{2ac}$.

(*b*) $\dfrac{x^2-y^2}{xy} \div \left(\dfrac{1}{x}+\dfrac{1}{y}\right) \times \dfrac{1}{x-y}$.