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(1) (a) Show that $(x+2)(x+4) \equiv x^2+6x+8$
(b) Hence, show that $(x+2)(x+4)(x+1) \equiv x^3+7x^2+14x+8$

(2) Show that $(x+1)(x+3)(x+5) \equiv x^3+9x^2+23x+15$

(3) Show that $(x-2)(x+1)(x+3) \equiv x^3+2x^2-5x-6$

(4) Expand and simplify each of the following:
(a) $(x+6)(x+2)(x+1)$ (b) $(x-1)(x-2)(x+5)$
(c) $(x-5)(x-3)(x-4)$ (d) $(x+1)(x-1)(7-x)$

(5) Show that $(2x-3)(x+1)(x-2) \equiv 2x^3-5x^2-x+6$

(6) Expand and simplify each of the following:
(a) $(3x+1)(x+3)(x+1)$ (b) $(2x-1)(x-1)(x+8)$
(c) $(x-5)(4x-3)(x+2)$ (d) $(3x+2)(2x-3)(4-x)$

(7) Expand and simplify $x(3-x)(4+x)$

(8) Expand and simplify $(x+3)^2(x-4)$

(9) Expand and simplify $(3x-2)^3$

(10) Write down the solutions to each of the following cubic equations:
(a) $(x+3)(x-2)(x+7)=0$ (b) $x(x-3)(x+10)=0$
(c) $(x-1)(3x-5)(x-6)=0$ (d) $(2x+1)(1-x)(3x+7)=0$

(11) (a) Show that $(4x-1)(3x+1)(x+2) \equiv 12x^3+25x^2+x-a$ where $a$ is a constant to be found.
(b) Hence, solve the equation $12x^3+25x^2+x=a$

(12) Show that
$(x-1)(x+3)(x+2) - (x+3)(x-3)(x+1) \equiv (3x+1)(x+3)$

(13) Show that $(x+1)^3+(x-1)^3 \equiv Ax(x^2+B)$ where $A$ and $B$ are constants.

(14) Expand and simplify $(1-x)^2(1+x)^2$

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