11 MT Ch 2 Algebra + Surds. Name:

1 Expand $(2x+3y)(x+2y)$

2 Expand $(x^2y+3)(x^2y-3)$

3 Expand $(x^3-1)^2$

4 Expand $(3x-1)(5x^3-9x^2-2x-2)$

If $x=\frac{1}{2}$, $y=\frac{1}{3}$, $z=\frac{1}{6}$

5 Find $\dfrac{x+y}{y+z}$

6 Find $\sqrt{\dfrac{2xy}{yz}}$

7 The Sum (S) of $1+2+3+\cdots+n$ is $S=\frac{n}{2}(1+n)$

Find Sum of $1+2+3+\cdots+100$

8 Find Sum of $14+15+\cdots+40$

9 If $a=-2$, $b=6$, $c=-1$

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

10 Find $\dfrac{a^2+a+2b}{b+c^2}$

Simplify surds

11 $\sqrt{48}$

12 $\sqrt{160}$

13 $\sqrt{75}+\sqrt{32}-\sqrt{27}$

14 $3\sqrt{32}+2\sqrt{50}-8\sqrt{18}$

15 $(\sqrt{12}-4)(\sqrt{12}+4)$

16 $(3\sqrt{5}-2\sqrt{3})^2$

Rationalise the denominator of

17 $\dfrac{1}{4\sqrt{5}}$

18 $\dfrac{1}{\sqrt{3}-\sqrt{2}}$

19 $\dfrac{\sqrt{7}-\sqrt{2}}{\sqrt{7}+\sqrt{2}}$

20 Find a and c if

$$\frac{\sqrt{3}-4}{2+3\sqrt{3}}=a+c\sqrt{3}$$

1 $(2x+3y)(x+2y)$
$= 2x^2 + 4xy + 3xy + 6y^2$
$= \underline{2x^2 + 7xy + 6y^2}$

2 $(x^2y+3)(x^2y-3)$
$= \underline{x^4y^2 - 9}$

3 $(x^3-1)^2 = \underline{x^6 - 2x^3 + 1}$

4 $(3x-1)(5x^3 - 9x^2 - 2x - 2)$
$= 15x^4 - 27x^3 - 6x^2 - 6x - 5x^3 + 9x^2 + 2x + 2$
$= \underline{15x^4 - 32x^3 + 3x^2 - 4x + 2}$

5 $\dfrac{(\frac{1}{2} + \frac{1}{3})}{(\frac{1}{3} + \frac{1}{4})} = \underline{1\frac{3}{7}}$

6 $\sqrt{\dfrac{(2 \times \frac{1}{2} \times \frac{1}{3})}{(\frac{1}{3} \times \frac{1}{4})}} = \underline{2}$

7 $S = \frac{100}{2} \times (1+100)$
$= \underline{5,050}$

8 $S_{40} = \frac{40}{2}(1+40) = 820$
$S_{13} = \frac{13}{2}(1+13) = 91$
$\therefore 14 + \ldots + 40 = 820 - 91$
$= \underline{729}$

9 $(4 \times 4 - 1)(3 \times 36 + 1)$
$= \underline{1635}$

10 $\dfrac{(4 - 2 + 12)}{(6+1)} = \underline{2}$

11 $\sqrt{48} = \sqrt{16 \times 3} = \underline{4\sqrt{3}}$

12 $\sqrt{160} = \sqrt{16 \times 10} = \underline{4\sqrt{10}}$

13 $\sqrt{25 \times 3} + \sqrt{16 \times 2} - \sqrt{9 \times 3}$
$= 5\sqrt{3} + 4\sqrt{2} - 3\sqrt{3} = \underline{2\sqrt{3} + 4\sqrt{2}}$

14 $3\sqrt{16 \times 2} + 2\sqrt{25 \times 2} - 8\sqrt{9 \times 2}$
$= 12\sqrt{2} + 10\sqrt{2} - 24\sqrt{2}$
$= \underline{-2\sqrt{2}}$

15 $(\sqrt{12} - 4)(\sqrt{12} + 4) = 12 - 16 = \underline{-4}$

16 $(3\sqrt{5} - 2\sqrt{3})^2 = 45 - 12\sqrt{15} + 12$
$= \underline{57 - 12\sqrt{15}}$

17 $\dfrac{1}{4\sqrt{5}} \times \dfrac{\sqrt{5}}{\sqrt{5}} = \underline{\dfrac{\sqrt{5}}{20}}$

18 $\dfrac{1}{\sqrt{3} - \sqrt{2}} \times \dfrac{\sqrt{3} + \sqrt{2}}{\sqrt{3} + \sqrt{2}} = \underline{\sqrt{3} + \sqrt{2}}$

19 $\dfrac{\sqrt{7} - \sqrt{2}}{\sqrt{7} + \sqrt{2}} \times \dfrac{\sqrt{7} - \sqrt{2}}{\sqrt{7} - \sqrt{2}}$
$= \dfrac{7 - \sqrt{14} - \sqrt{14} + 2}{5} = \underline{\dfrac{9 - 2\sqrt{14}}{5}}$

20 $\dfrac{(\sqrt{3} - 4)}{(2 + 3\sqrt{3})} \times \dfrac{(2 - 3\sqrt{3})}{(2 - 3\sqrt{3})}$
$= \dfrac{2\sqrt{3} - 9 - 8 + 12\sqrt{3}}{4 - 27}$
$= \dfrac{-17 + 14\sqrt{3}}{-23} = a + c\sqrt{3}$

$\therefore a = \underline{\dfrac{17}{23}}, \quad c = \underline{-\dfrac{14}{23}}$