Review #2

1) $\frac{1}{x}\cdot\frac{(x+3)}{(x+3)} + \frac{1}{x+3}\cdot\frac{(x)}{(x)} = \frac{x+3+x}{x(x+3)} = \boxed{\frac{2x+3}{x(x+3)}}$

2) $\frac{2}{z-3} + \frac{4}{3-z}\cdot\frac{(-1)}{(-1)} = \frac{2-4}{z-3} = \boxed{\frac{-2}{z-3}}$

3) $\frac{3}{x-1}\cdot\frac{(x)}{(x)} - \frac{2}{x}\cdot\frac{(x-1)}{(x-1)} = \frac{3x-2(x-1)}{x(x-1)}$

$= \frac{3x-2x+2}{x(x-1)} = \boxed{\frac{x+2}{x(x-1)}}$ B

4) ~~$\frac{x+2}{x} = \frac{x+1}{x-3}$~~

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

$x^2-3x+2x-6 = x^2+x$

$x^2-x-6 = x^2+x$

$-x^2-x \qquad -x^2-x$

$-2x-6=0$

$-2x=6$

$\boxed{x=-3}$

5. $\frac{x}{x-4}\cdot\frac{(x+3)}{(x+3)} - \frac{1}{x+3}\cdot\frac{(x-4)}{(x-4)} = \frac{28}{x^2-x-12}$

$(x-4)(x+3)$

$x^2+3x-x+4 = 28$

$x^2+2x-24=0$

$(x+6)(x-4)$

$\boxed{x=-6}$ ~~$x=4$~~

6. $\frac{x}{x-1} + \frac{2}{x^2-1} = \frac{8}{x+1}$

$\frac{x(x+1)}{x-1} + \frac{2}{(x+1)(x-1)} = \frac{8(x-1)}{(x+1)}$

$x(x+1) + 2 = 8(x-1)$

$x^2 + x + 2 = 8x - 8$

$-8x + 8 \quad -8x + 8$

$x^2 - 7x + 10 = 0$

$(x-5)(x-2) = 0$

$\boxed{x = 5 \quad x = 2}$

5+2 = 7

7. $\frac{x(x-2)}{x-3} + \frac{4(x-3)}{x-2} = \frac{-2x}{x^2-5x+6}$

$\frac{-2x}{(x-3)(x-2)}$

$x(x-2) + 4(x-3) = -2x$

$x^2 - 2x + 4x - 12 = -2x$

$x^2 + 2x - 12 = -2x$

$+2x \quad +2x$

$x^2 + 4x - 12 = 0$

$(x+6)(x-2) = 0$

$\boxed{x = -6} \quad \cancel{x = 2}$

8. $-2\sqrt{18x^2y^4}$

$-2\sqrt{9}\sqrt{2}\sqrt{x^2}\sqrt{y^4}$

$-2(3)xy^2\sqrt{2}$

$\boxed{-6xy^2\sqrt{2}}$

9) $\sqrt[3]{32x^{10}y^{13}}$

$\sqrt[3]{8}\sqrt[3]{4}\sqrt[3]{x^9}\sqrt[3]{x}\sqrt[3]{y^{12}}\sqrt[3]{y}$

$\boxed{2x^3y^4\sqrt[3]{4xy}}$

10. $\sqrt{3x+1} + 1 = x$

$-1 \quad -1$

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

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

$3x+1 = x^2 - x - x + 1$

$3x+1 = x^2 - 2x + 1$

$-3x-1 \quad -3x-1$

$x^2 - 5x = 0$

$x(x-5) = 0$

$x = 0$ $\quad \boxed{x = 5}$

Check

$\sqrt{3(0)+1} + 1 = 0$

$1 + 1 \neq 0$

$\sqrt{3(5)+1} + 1 = 5$

$4 + 1 = 5$ ✓

11. $(\sqrt{8x-2})^2 = (\sqrt{5x+10})^2$

$8x - 2 = 5x + 10$

$-5x \quad -5x$

$3x - 2 = 10$

$3x = 12$

$\boxed{x = 4}$

Check

$\sqrt{8(4)-2} = \sqrt{5(4)+10}$

$\sqrt{30} = \sqrt{30}$ ✓

12. $6 - \sqrt{x-2} = 2$

$-6 \quad -6$

$\frac{-\sqrt{x-2}}{-1} = \frac{-4}{-1}$

$(\sqrt{x-2})^2 = (4)^2$

$x - 2 = 16$

$\boxed{x = 18}$

Check

$6 - \sqrt{18-2} = 2$

$6 - 4 = 2$

$2 = 2$ ✓

14. $4a^4 - a^2 \mid 4a^2x^2 + x^2$

$a^2(4a^2-1) \mid -x^2(4a^2-1)$

$(a^2 - x^2)(4a^2 - 1)$

$(a-x)(a+x)(2x-1)(2x+1)$

(A)

13. $2x^4 + 5x^2 - 12$

-24, $+8x^2$, $-3x^2$, 5

$2x^4 + 8x^2 \mid -3x^2 - 12$

$2x^2(x^2+4) \mid -3(x^2+4)$

$(2x^2-3)(x^2+4)$ (A)

15. $x+2 \overline{)\, x^4+3x^3-x^2+0x+8}$

x^3+x^2-3x+6

$-x^4+2x^3$

x^3-x^2

$-x^3+2x^2$

$-3x^2+0x$

$+3x^2+6x$

$6x+8$

$-6x-12$

-4

D

16. $\dfrac{2^{4z}}{2^{4z+1}}$

$4z-(4z+1)$

$4z-4z-1$

$=-1$

A

17. $\dfrac{\sqrt[4]{x}\cdot\sqrt[3]{x}}{\sqrt[6]{x}} = \dfrac{x^{\frac{1}{4}}\cdot x^{\frac{1}{3}}}{x^{\frac{1}{6}}} = \dfrac{x^{\frac{7}{12}}}{x^{1/6}} = \boxed{x^{5/12}}$

18. $\dfrac{54a^3b^7}{36a^{-2}b^{10}} = \dfrac{3a^5b^{-3}}{2} = \boxed{\dfrac{3a^5}{2b^3}}$

19) $(3xy^{-3})^{-2}$

$= \left(\dfrac{1}{3xy^{-3}}\right)^2$

$= \dfrac{1}{9x^2y^{-6}} = \boxed{\dfrac{y^6}{9x^2}}$

20) $\left(\dfrac{3m^5n^4}{m^0n^{-3}}\right)^{-2}$

$= \left(\dfrac{m^0n^{-3}}{3m^5n^4}\right)^2$

$= \left(\dfrac{m^{-5}n^{-7}}{3}\right)^2 = \dfrac{m^{-10}n^{-14}}{9}$

$= \boxed{\dfrac{1}{9m^{10}n^{14}}}$

21. $4x^{\frac{1}{2}} = 4\sqrt{x}$ **C**

22. $\left(\frac{1}{n}\right)^{-\frac{2}{3}} = n^{\frac{2}{3}} = \sqrt[3]{n^2}$ **C**