Review 4B Part 1

① $72x^2y\sqrt[4]{7x^2}$

② $\frac{\sqrt[3]{441}}{7}$

③ $39\sqrt[3]{2}$

④ $2x^4y^3\sqrt[4]{2y}$

⑤ $\left(\frac{1}{2}\right)^{3/4}$

⑥ $7^{3/2}a^{1/2}z^3$

⑦ $4a^{\frac{6}{5}}b^{\frac{8}{5}}$

⑧ $\sqrt{17^5}$

⑨ $\sqrt[3]{11^4c^3d^6}$ or $121\sqrt[3]{c^3d^6}$

⑩ $\sqrt[4]{2^6p^2r^3}$ or $16\sqrt[4]{p^2r^3}$

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⑫ $\frac{2^{4/3}x}{y^{1/6}}$

⑬ $x^{11/2}$

(14) $x^{1/5}$

(15) $x^{8/5}y^{13/2}$

(16) $2x^{7/6}$

(17) $\frac{y^{8/5}}{x^{7/6}}$

(18) $\frac{x^{2/5}}{y^{8}}$

(19) $5x^{2/3}$

(20) $\frac{x^{31/6}}{2^{5/2}}$

(21) $\frac{z^{18}}{13^{3}}$

(22) $5^{11/6}y^{14/3}$

(23) $h(x) = 2x^2 + 8x - 42$

(24) $h(x) = -x^2 + 9$

(25) $h(x) = 4x^3 + 4x^2 - 132x + 252$

(26) $h(x) = x^2 - 9$

(27) $h(x) = \frac{x+2}{4}$ where $x \neq 3$

(28) $h(x) = \frac{4}{x+7}$ where $x \neq -7, 3$

29. $f(g(x)) = 16x^2 - 80x + 75$

30. $g(g(x)) = 16x - 60$

31. $g(f(x)) = 4x^2 + 16x - 96$

32. 115

33. -95

34. 15

35. $\frac{9}{25}$ or 0.36

36. $f(x)^{-1} = -\frac{5}{6}x + \frac{20}{3}$

37. $f(x)^{-1} = 2\sqrt[4]{x+3} - 12$

38. $y^{-1} = \left(\frac{1}{5}(x-6)\right)^3 + 7$

39. $f(x)^{-1} = \frac{-3}{x-4} - 7$

40. $y^{-1} = \left(-\frac{1}{4}(x-4)\right)^2 - 11$

41. $f(g(x)) = \frac{1}{3}(3x-18) + 6$

$= x - 6 + 6$

$f(g(x)) = x$

$g(f(x)) = 3\left(\frac{1}{3}x + 6\right) - 18$

$= x + 18 - 18$

$g(f(x)) = x$

Since $f(g(x)) = g(f(x)) = x$, they are inverses.

(42) $f(g(x)) = \sqrt{\frac{(27x^2+4)-4}{3}}$

$= \sqrt{\frac{27x^2}{3}}$

$= \sqrt{9x^2}$

$= 3x$

Since $f(g(x)) \neq x$ then they are NOT inverses.

(43) $f(g(x)) = \frac{1}{5}(\sqrt[3]{5x})^3$

$= \frac{1}{5}(5x)$

$= x$

$g(f(x)) = \sqrt[3]{5(\frac{1}{5}x^3)}$

$= \sqrt[3]{x^3}$

$= x$

Since $f(g(x)) = g(f(x)) = x$, then they are inverses

$$\left(\frac{13^2}{2^{12}}\right)^{-\frac{3}{2}}$$

$$\left(\frac{2^{12}}{13^2}\right)^{\frac{3}{2}}$$

$$\frac{2^{\cancel{12}^{6}\cdot\frac{3}{\cancel{2}_1}}}{13^{\cancel{2}^{1}\cdot\frac{3}{\cancel{2}_1}}} = \frac{2^{18}}{13^3}$$

$$\left(125x^{-\frac{2}{3}}y^{8}\right)^{\frac{1}{2}} \cdot \sqrt[3]{5xy^2}$$

$$\left(5^3 x^{-\frac{2}{3}} y^{8}\right)^{\frac{1}{2}} \cdot \left(5xy^2\right)^{\frac{1}{3}}$$

$$5^{3\cdot\frac{1}{2}} \cdot x^{-\frac{2}{3}\cdot\frac{1}{2}} \cdot y^{8\cdot\frac{1}{2}} \cdot 5^{\frac{1}{3}} \cdot x^{\frac{1}{3}} \cdot y^{2\cdot\frac{1}{3}}$$

$$5^{\frac{3}{2}} \cdot x^{-\frac{1}{3}} \cdot y^{4} \cdot 5^{\frac{1}{3}} x^{\frac{1}{3}} y^{\frac{2}{3}}$$

$$5^{\frac{3}{2}+\frac{1}{3}} \; x^{-\frac{1}{3}+\frac{1}{3}} \; y^{4+\frac{2}{3}}$$

$$5^{\frac{11}{6}} \; x^{0} \; y^{\frac{14}{3}}$$

$$\boxed{5^{\frac{11}{6}} y^{\frac{14}{3}}}$$

$(f-g)(8)$

$f-g$

$(2x^2-5x+18)-(7-2x)$

$(2(8)^2-5(8)+18)-(7-2(8))$

$(g \circ f)(-3)$

$g(f(x))$

$f(-3)=2(-3)^2-5(-3)+18$

$f(-3)=51$

$g(51)=7-2(51)$

$=-95$

$g(f(x))=7-2(2x^2-5x+18)$

$g(f(-3))=7-2(2(-3)^2-5(-3)+18)$

$g(f(-3))=-95$