

SOLUTIONS => CHAPTER 5 & 6 REVIEWMULTIPLE CHOICE

$$\begin{aligned}
 1. & 7\sqrt{7} - 6\sqrt{12} - (4\sqrt{28} + 4\sqrt{3}) \\
 &= 7\sqrt{7} - 6\sqrt{(2)(2)(3)} - 4\sqrt{(2)(2)(7)} - 4\sqrt{3} \\
 &= 7\sqrt{7} - 6(2)\sqrt{3} - 4(2)\sqrt{7} - 4\sqrt{3} \\
 &= 7\sqrt{7} - 12\sqrt{3} - 8\sqrt{7} - 4\sqrt{3} \\
 &= -1\sqrt{7} - 16\sqrt{3} \quad C
 \end{aligned}$$

$$\begin{aligned}
 2. & \sqrt[5]{64n^{10}m^{15}} \\
 &= \sqrt[5]{(2)(2)(2)(2)(2)(n^2)(n^2)(m^3)(m^3)(m^3)} \\
 &= 2(n)(n)(m)(m)(m)\sqrt[5]{2} \\
 &= 2n^2m^3\sqrt[5]{2} \quad D
 \end{aligned}$$

$$\begin{aligned}
 3. & 3\sqrt{175} + 6\sqrt{63} \\
 &= 3\sqrt{(5)(5)(7)} + 6\sqrt{(3)(3)(7)} \\
 &= 3(5)\sqrt{7} + 6(3)\sqrt{7} \\
 &= 15\sqrt{7} + 18\sqrt{7} \\
 &= 33\sqrt{7} \quad B
 \end{aligned}$$

$$\begin{aligned}
 4. & 6\sqrt{80} - 2\sqrt{20} \\
 &= 6\sqrt{(2)(2)(2)(2)(5)} - 2\sqrt{(2)(2)(5)} \\
 &= 6(2)(2)\sqrt{5} - 2(2)\sqrt{5} \\
 &= 24\sqrt{5} - 4\sqrt{5} \\
 &= 20\sqrt{5} \quad D
 \end{aligned}$$

$$\begin{aligned}
 5. & -7\sqrt{6}(-6\sqrt{5} - 2\sqrt{6}) \\
 &= 42\sqrt{30} + 14(6) \\
 &= 42\sqrt{30} + 84 \quad C
 \end{aligned}$$

$$\begin{aligned}
 6. & (\sqrt{19} - \sqrt{7})(\sqrt{19} + \sqrt{7}) \\
 &= 19 + \sqrt{133} - \sqrt{133} - 7 \\
 &= 19 - 7 \\
 &= 12
 \end{aligned}$$

C

$$\begin{aligned}
 7. & \sqrt{7x} = 5 \\
 & (\sqrt{7x})^2 = (5)^2 \\
 & \frac{7x}{7} = \frac{25}{7} \\
 & x = \frac{25}{7}
 \end{aligned}$$

B

$$\begin{aligned}
 8. & \sqrt{4x} - 5 = 6 \\
 & \sqrt{4x} = 6 + 5 \\
 & \sqrt{4x} = 11 \\
 & (\sqrt{4x})^2 = (11)^2 \\
 & \frac{4x}{4} = \frac{121}{4} \\
 & x = \frac{121}{4}
 \end{aligned}$$

C

$$\begin{aligned}
 9. & \sqrt{x+3} = \sqrt{2x+8} \\
 & (\sqrt{x+3})^2 = (\sqrt{2x+8})^2 \\
 & x+3 = 2x+8 \\
 & 3-8 = 2x-x \\
 & -5 = x
 \end{aligned}$$

B

Solutions to Chapter 5-Chapter 6 Exam Review.notebook

10. $-4 - \sqrt{4-x} = 6$

Restriction: $4-x \geq 0$
 $-\frac{x}{-1} \geq \frac{-4}{-1}$
 $x \leq 4$

C

11. $\frac{12}{x^2-4}$

$= \frac{12}{(x-2)(x+2)}$

N.P. Values
 $x-2 \neq 0$ $x+2 \neq 0$
 $x \neq 2$ $x \neq -2$

A

12. $\frac{-3x+12}{32-8x}$

$= \frac{-3x+12}{-8x+32}$

$= \frac{-3(x-4)}{-8(x-4)}$

$= \frac{-3}{-8}$

$= \frac{3}{8}$

C

13. $\frac{6x^9}{3x^3} \times \frac{x^8}{9x^6}$

$= \frac{6x^{17}}{27x^9}$

$= \frac{2}{9}x^8$

A

Solutions to Chapter 5-Chapter 6 Exam Review.notebook

$$\begin{aligned}
 14. \quad & \frac{12x^{12}}{4x^3} \div \frac{x^8}{24x^6} \\
 = & 3x^9 \times \frac{24x^6}{x^8} \\
 = & \frac{72x^{15}}{x^8} \\
 = & 72x^7
 \end{aligned}$$

D

$$\begin{aligned}
 15. \quad & \frac{x^2+6x}{2x^2+15x+27} \times \frac{x+3}{x^2-36} \\
 = & \frac{x(x+6)}{(2x+9)(x+3)} \times \frac{x+3}{(x-6)(x+6)} \\
 = & \frac{x}{(2x+9)(x-6)}
 \end{aligned}$$

$$\begin{aligned}
 & \left\{ \begin{aligned}
 * 2x^2+15x+27 \\
 (x+9)(x+6) \\
 \frac{2}{2} \quad \frac{2}{2} \\
 (2x+9)(x+3)
 \end{aligned} \right.
 \end{aligned}$$

B

$$\begin{aligned}
 16. \quad & \frac{13}{x+5} - \frac{12}{x+5} \\
 = & \frac{1}{x+5}
 \end{aligned}$$

D

$$\begin{aligned}
 17. \quad & \frac{x+8}{x^2+9x+20} + \frac{x+5}{x^2+7x+12} \\
 = & \frac{x+8}{(x+4)(x+5)} + \frac{x+5}{(x+3)(x+4)} \\
 = & \frac{(x+8)(x+3)}{(x+3)(x+4)(x+5)} + \frac{(x+5)(x+5)}{(x+3)(x+4)(x+5)} \\
 = & \frac{x^2+3x+8x+24 + x^2+5x+5x+25}{(x+3)(x+4)(x+5)} \\
 = & \frac{2x^2+21x+49}{(x+3)(x+4)(x+5)}
 \end{aligned}$$

D

$$18. \frac{x}{x+1} = \frac{4-x}{x^2-3x-4} + \frac{6}{x-4}$$

$$\frac{x}{x+1} = \frac{4-x}{(x+1)(x-4)} + \frac{6}{x-4} \quad * \text{N.P. Values}$$

$x \neq -1, 4$

$$\cancel{(x+1)}(x-4) \left[\frac{x}{\cancel{x+1}} \right] = \cancel{(x+1)}\cancel{(x-4)} \left[\frac{4-x}{\cancel{(x+1)}\cancel{(x-4)}} \right] + \cancel{(x+1)}\cancel{(x-4)} \left[\frac{6}{\cancel{x-4}} \right]$$

$$x(x-4) = 4-x + 6(x+1)$$

$$x^2 - 4x = 4 - x + 6x + 6$$

$$x^2 - 4x = 10 + 5x$$

$$x^2 - 4x - 5x - 10 = 0$$

$$x^2 - 9x - 10 = 0$$

$$(x+1)(x-10) = 0$$

$$x+1=0 \quad x-10=0$$

$$x = -1$$

$$x = 10$$

A

↑
Extraneous

$$19. \frac{9x+2}{x-9} = \frac{2}{5}$$

$$5(x-9) \left[\frac{9x+2}{x-9} \right] = 5(x-9) \left[\frac{2}{5} \right]$$

$$5(9x+2) = 2(x-9)$$

$$45x+10 = 2x-18$$

$$45x-2x = -18-10$$

$$\frac{43x}{43} = \frac{-28}{43}$$

$$x = \frac{-28}{43} \quad A$$

MATCHING

$$1. 4\sqrt{3} - 9\sqrt{192}$$

$$= 4\sqrt{3} - 9\sqrt{(2)(2)(2)(2)(3)}$$

$$= 4\sqrt{3} - 9(2)(2)(2)\sqrt{3}$$

$$= 4\sqrt{3} - 72\sqrt{3}$$

$$= -68\sqrt{3} \quad C$$

$$2. 4x(\sqrt[3]{24x^4})$$

$$= 4x(\sqrt[3]{(2)(2)(2)(3)(x^3)(x^3)(x^3)(x^2)})$$

$$= 4x(2)(x)(x)(x)\sqrt[3]{3x^2}$$

$$= 8x^4\sqrt[3]{3x^2} \quad E$$

$$3. \frac{4\sqrt{3}(\sqrt{8+9})}{\sqrt{8-9}\sqrt{8+9}}$$

$$= \frac{4\sqrt{24+36\sqrt{3}}}{(\sqrt{8})^2 - (9)^2}$$

$$= \frac{4\sqrt{24+36\sqrt{3}}}{8-81}$$

$$= \frac{4\sqrt{24+36\sqrt{3}}}{-73} \quad B$$

$$4. (4\sqrt{3})(8\sqrt{9})$$

$$= 32\sqrt{27}$$

$$= 32\sqrt{(3)(3)(3)}$$

$$= 32(3)\sqrt{3}$$

$$= 96\sqrt{3} \quad A$$

SHORT ANSWER

$$1a) \frac{2\sqrt{3}+4}{\sqrt{3}} \left(\frac{\sqrt{3}}{\sqrt{3}} \right)$$

$$= \frac{2(3)+4\sqrt{3}}{3}$$

$$= \frac{6+4\sqrt{3}}{3}$$

$$b) \frac{5\sqrt{3}+\sqrt{2}}{2\sqrt{3}-\sqrt{2}} \left(\frac{2\sqrt{3}+\sqrt{2}}{2\sqrt{3}+\sqrt{2}} \right)$$

$$= \frac{10(3)+5\sqrt{6}+2\sqrt{6}+2}{(2\sqrt{3})^2-(\sqrt{2})^2}$$

$$= \frac{30+7\sqrt{6}+2}{4(3)-2}$$

$$= \frac{32+7\sqrt{6}}{12-2}$$

$$= \frac{32+7\sqrt{6}}{10}$$

$$2. \quad 4 - \sqrt{4+x^2} = x$$

$$4-x = \sqrt{4+x^2}$$

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

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

$$16-4x-4x+x^2 = 4+x^2$$

$$16-8x+x^2 = 4+x^2$$

$$16-4-8x+x^2-x^2 = 0$$

$$12-8x = 0$$

$$\frac{12}{8} = \frac{8x}{8}$$

$$\frac{12}{8} = x$$

$$\frac{3}{2} = x$$

* No NP. Values
 Since $4+x^2$
 will always
 be positive.

$$3. \frac{5}{x-1} + \frac{2}{x+1} = -6$$

$$\cancel{(x-1)}(x+1) \left[\frac{5}{\cancel{x-1}} \right] + (x-1)\cancel{(x+1)} \left[\frac{2}{\cancel{x+1}} \right] = \cancel{(x-1)}(x+1)(-6)$$

N.P. Values
 $x \neq 1, -1$

$$5(x+1) + 2(x-1) = -6(x-1)(x+1)$$

$$5x+5+2x-2 = -6(x^2+1x-1x-1)$$

$$7x+3 = -6(x^2-1)$$

$$7x+3 = -6x^2+6$$

$$6x^2+7x+3-6=0$$

$$6x^2+7x-3=0 \quad \frac{9}{6} \times \frac{-2}{6} = -18$$

$$(x+\frac{9}{6})(x-\frac{2}{6})=0 \quad \frac{9}{6} + \frac{-2}{6} = 7$$

$$(x+\frac{3}{2})(x-\frac{1}{3})=0$$

$$(2x+3)(3x-1)=0$$

$$2x+3=0 \quad 3x-1=0$$

$$2x=-3 \quad 3x=1$$

$$x = -\frac{3}{2} \checkmark \quad x = \frac{1}{3} \checkmark$$

PROBLEM

1a) $A = \frac{x+4}{x^2+9x+20}$

$A = \frac{\cancel{x+4}}{(\cancel{x+4})(x+5)}$

$A = \frac{1}{x+5}$

$x \neq -4, -5$

$B = \frac{3x^2-9x}{x^2+3x-18}$

$B = \frac{3x(\cancel{x-3})}{(x+6)(\cancel{x-3})}$

$B = \frac{3x}{x+6}$

$x \neq -6, 3$

b)

i) $A - B$

$= \frac{1}{x+5} - \frac{3x}{x+6}$

$= \frac{1(x+6)}{(x+5)(x+6)} - \frac{3x(x+5)}{(x+5)(x+6)}$

$= \frac{x+6-3x^2-15x}{(x+5)(x+6)}$

$= \frac{-3x^2-14x+6}{(x+5)(x+6)}$

ii) AB

$= \left(\frac{1}{x+5}\right)\left(\frac{3x}{x+6}\right)$

$= \frac{3x}{(x+5)(x+6)}$

iii) $B \div A$
 $= \left(\frac{3x}{x+6}\right) \div \left(\frac{1}{x+5}\right)$

$= \frac{3x}{x+6} \times \frac{x+5}{1}$

$= \frac{3x(x+5)}{x+6}$