hw solutions
chpt 1 : review
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1. Evaluate:

(a) $|\pi - 2\sqrt{3}| - |\sqrt{3} - \sqrt{2}|$

$= (2\sqrt{3} - \pi) - (\sqrt{3} - \sqrt{2})$

$= \sqrt{3} - \pi + \sqrt{2}$

(b) $\left[\left(-\frac{1}{3}\right)^{-3}\right]^{1/3}$

$= \left(-\frac{1}{3}\right)^{-1} = -3$

3. Rationalize the denominator:

(a) $\frac{2x}{3\sqrt{y}} \cdot \frac{\sqrt{y}}{\sqrt{y}} = \frac{2x\sqrt{y}}{3y}$

(b) $\frac{x}{\sqrt{x}-4} \cdot \frac{\sqrt{x}+4}{\sqrt{x}+4} = \frac{x\sqrt{x}+4x}{x-16}$

5. Rationalize the numerator:

$\frac{\sqrt{x}+\sqrt{y}}{\sqrt{x}-\sqrt{y}} \cdot \frac{\sqrt{x}-\sqrt{y}}{\sqrt{x}-\sqrt{y}} = \frac{x-y}{x-2\sqrt{xy}+y}$

6. Factor completely:

(a) $12x^3 - 10x^2 - 12x$

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

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

(b) $2bx - 2by + 3cx - 3cy$

$= 2b(x-y) + 3c(x-y)$

$= (2b+3c)(x-y)$

7. Solve:

(a) $12x^2 - 9x - 3 = 0$

$3(4x^2 - 3x - 1) = 0$

$3(x-1)(4x+1) = 0$

$x = 1, -1/4$

(b) $3x^2 - 5x + 1 = 0$

$x = \frac{5 \pm \sqrt{5^2 - 4\cdot 3\cdot 1}}{2\cdot 3}$

$= \frac{5 \pm \sqrt{25-12}}{6}$

$= \frac{5 \pm \sqrt{13}}{6}$

2. Simplify:

(a) $\sqrt[3]{64x^6} \cdot \sqrt{9y^2x^6}$ b/c $\sqrt[3]{\ } = (\ )^{1/3}$, $\sqrt{\ } = (\ )^{1/2}$

$= 4x^2 \cdot 3yx^3$

$= 12x^5y$

(b) $\left(\frac{a^{-3}}{b^{-4}}\right)^2 \left(\frac{b}{a}\right)^{-3}$

$= \left(\frac{b^4}{a^3}\right)^2 \cdot \frac{b^{-3}}{a^{-3}} = \frac{b^8 b^{-3}}{a^6 a^{-3}} = \frac{b^5}{a^3}$

4. Simplify:

(a) $\frac{(x^2+1)(\frac{1}{2}x^{-1/2}) - x^{1/2}(2x)}{(x^2+1)^2}$

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

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

(b) $-\frac{3x}{\sqrt{x+2}} + 3\sqrt{x+2}$

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

$= \frac{-3x + 3x + 6}{\sqrt{x+2}} = \frac{6}{\sqrt{x+2}}$

8. distance b/t $(-2, 4)$ & $(6, 8)$

$D = \sqrt{(6--2)^2 + (8-4)^2} = \sqrt{8^2+4^2} = \sqrt{80} = 4$

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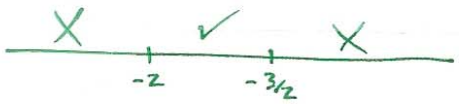
30. $\frac{1}{x+2} > 2$



$\frac{1}{x+2} - 2 > 0$

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

$-2x - 3 = 0$ & $x + 2 = 0$

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

$-2 < x < -3/2$

32. $\left|\frac{x+1}{x-1}\right| = 5$

$\frac{x+1}{x-1} = 5$ OR $\frac{x+1}{x-1} = -5$

$x+1 = 5(x-1)$ $\quad x+1 = -5(x-1)$

$x+1 = 5x-5$ $\quad x+1 = -5x+5$

$6 = 4x$ $\quad 6x = 4$

$3/2 = x$ $\quad x = 2/3$