Chapter 2 Review – No Calculators Name: Key Block: ____

1. State any restrictions and simplify:

a) $-6\sqrt{x}+4\sqrt{x}+9\sqrt{x}$, $x \geq 0$

$=7\sqrt{x}$

b) $\frac{-3\sqrt{s}+4\sqrt{t}}{4\sqrt{s}+3\sqrt{t}}$, $s,t \geq 0$

$$\frac{(-3\sqrt{s}+4\sqrt{t})(4\sqrt{s}-3\sqrt{t})}{(4\sqrt{s}+3\sqrt{t})(4\sqrt{s}-3\sqrt{t})}$$

$$=\frac{-12s+25\sqrt{st}-12t}{16s-9t}$$

c) $\sqrt{162x^2}$, $x \in \mathbb{R}$

$=9|x|\sqrt{2}$

d) $\frac{1}{\sqrt{3}}-\frac{1}{\sqrt{7}}$

$=\frac{1}{\sqrt{3}}\times\frac{\sqrt{3}}{\sqrt{3}}-\frac{1}{\sqrt{7}}\times\frac{\sqrt{7}}{\sqrt{7}}$

$=\frac{\sqrt{3}}{3}-\frac{\sqrt{7}}{7}$

$=\frac{7\sqrt{3}}{21}-\frac{3\sqrt{7}}{21}=\frac{7\sqrt{3}-3\sqrt{7}}{21}$

e) $\sqrt[3]{135}+\sqrt[3]{5}-3\sqrt{5}$

$=3\sqrt[3]{5}+\sqrt[3]{5}-3\sqrt{5}$

$=4\sqrt[3]{5}-3\sqrt{5}$

f) $\sqrt[3]{-27x^4y^3}$, $x,y \in \mathbb{R}$

$=-3xy\sqrt[3]{x}$

2. Simplify:

a) $|-9-5|+5|9+(-10)|$

$=|-14|+5|-1|$

$=14+5$

$=19$

b) $\frac{|9+(-9)|}{9+5}(-9)$

$=0$

c) $\sqrt{(-9+5)^2}-|-9-(-5)|$

$=|-9+5|-|-9+5|$

$=0$

d) What is the distance between 7 and $-1\frac{4}{7}$ on a number line?

$|7-(-1\frac{4}{7})|$ or $|-1\frac{4}{7}-7|$

$=7+1\frac{4}{7}$

$=8\frac{4}{7}$

3. Solve, remember to state any restrictions and check your solutions:

a) $\sqrt{12x} - 5 = 6$, $x \geq 0$

$\sqrt{12x} = 11$

$12x = 121$

$x = \frac{121}{12}$

check 1:

$\frac{121}{12} \geq 0$

check 2: LHS

$\sqrt{12 \times \frac{121}{12}} - 5$

$= \sqrt{121} - 5$

$= 11 - 5$

$= 6$

RHS

6

$\boxed{x = \frac{121}{12}}$

b) $\sqrt{x+5} = \sqrt{2x-7}$

$x + 5 \geq 0$ and $2x - 7 \geq 0$

$x \geq -5$ and $x \geq \frac{7}{2}$

so $\boxed{x \geq \frac{7}{2}}$

$x + 5 = 2x - 7$

$x = 12$

check: $12 \geq \frac{7}{2}$

check:

LHS

$\sqrt{12+5}$

$= \sqrt{17}$

RHS

$\sqrt{2 \times 12 - 7}$

$= \sqrt{24 - 7}$

$= \sqrt{17}$

$\boxed{x = 12}$

c) $-2\sqrt{x+1} - 2 = 2\sqrt{x+1} + 3$, $x \geq -1$

$-4\sqrt{x+1} = 5$

$\sqrt{x+1} = -\frac{5}{4}$

Not possible.

No solution.

d) $\sqrt{x-3} = x - 5$, $x \geq 3$

$x - 3 = (x-5)^2$

$x - 3 = x^2 - 10x + 25$

$x^2 - 11x + 28 = 0$

$(x-7)(x-4) = 0$

$x = 7$, $x = 4$

$7 \geq 3$, $4 \geq 3$

$x = 7$: LHS RHS

$\sqrt{7-3}$ $7-5$

$= \sqrt{4}$ $= 2$

$= 2$

$\boxed{x = 7}$ is a solution

$x = 4$: LHS RHS

$\sqrt{4-3}$ $4-5$

$= 1$ $= -1$

$x = 4$ is NOT a solution.