Reversing Operations

K. $3|x-5|+11=20$

$-11 \quad -11$

$\frac{3|x-5|}{3}=\frac{9}{3}$

$|x-5|=3$

$x-5=3$

$x=8$

$x-5=-3$

$x=2$

Q. $5(x+1)^2+6=186$

$-6 \quad -6$

$\frac{5(x+1)^2}{5}=\frac{180}{5}$

$(x+1)^2=36$

$x+1=6$

$x=5$

$x+1=-6$

$x=-7$

S. $3\left(\frac{x-5}{3}-4\right)=(-11)\cdot 3$

$x-5-12=-33$

$x-17=-33$

$x=-16$

10. $\frac{1}{2}\sqrt[3]{x+1}-5=-3$

$+5 \quad +5$

$2\left(\frac{1}{2}\sqrt[3]{x+1}\right)=(2)\cdot 2$

$\left(\sqrt[3]{x+1}\right)^3=(4)^3$

$x+1=64$

$x=63$

9) $4 - 5|x+1| = -21$

$-4 \qquad -4$

$\frac{-5|x+1|}{-5} = \frac{-25}{-5}$

$|x+1| = 5$

$x+1 = 5$

$x = 4$

$x+1 = -5$

$x = -6$

8) $4(x-2)^3 - 2 = 101$

$+2 \qquad +2$

$\frac{4(x-2)^3}{4} = \frac{108}{4}$

$\sqrt[3]{(x-2)^3} = \sqrt[3]{27}$

$x - 2 = 3$

$x = 5$

7) $(x+2)\left(\frac{1}{x+2} - 3\right) = \left(\frac{10}{x+2}\right)(x+2)$

$1 - 3x - 6 = 10$

$-3x - 5 = 10$

$+5 \qquad +5$

$\frac{-3x}{-3} = \frac{15}{-3}$

$x = -5$

6) $|x-4| = 2x$

$x - 4 = 2x$

$-x \qquad -x$

$-4 = x$

$x - 4 = -2x$

$-x \qquad -x$

$-4 = -3x$

$\frac{4}{3} = x$

Extra Practice

3) SADMEP: Subtract k,
Divide a,
Square root,
Add h

Usually get 2 solutions because graph looks like this: ∪ or because positive numbers have 2 square roots ($\sqrt{9} = \pm 3$)

Get 1 solution if graph looks like this: ∪ or ⌐ or because zero has 1 square root ($\sqrt{0} = 0$)

Get 0 solutions if graph looks like this: ∪ or ∩ or because negatives don't have square roots ($\sqrt{-3} \neq ?$)

4) $p(t) = -16(t-2)^2 + 70$

a) Platform means $t = 0$. $p(0) = -16(0-2)^2 + 70$
$-16(4) + 70 = -64 + 70 \neq 6$ (6 feet high)

b) Max height = Vertex = (2, 70). 70 feet high.

c) $-16(t-2)^2 + 70 = 50$
$-16(t-2)^2 = -20$
$(t-2)^2 = 5/4$
$t - 2 = \pm\sqrt{5/4}$
$t = 2 + \sqrt{5/4}$ ← Ignore the negative.

5a) $\sqrt{x-1}+2=5$

$-2\ -2$

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

$x-1=9$

$x=10$

b) $-12+4\sqrt{x+1}=-8$

$+12\qquad\qquad +12$

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

$\sqrt{x+1}=1$

$x+1=1$

$x=0$

c) $2\sqrt{3x-2}+4=16$

$-4\ -4$

$\frac{2\sqrt{3x-2}}{2}=\frac{12}{2}$

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

$3x-2=36$

$3x=38$

$x=38/3$

d) $\sqrt{x+2}=x$

$x+2=x^2$

$0=x^2-x-2$

	x	-2
x	x^2	$-2x$
1	$1x$	-2

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

$x=-1$ $x=2$

6) SADMEP. 1 solution or 0 solutions depending on graph ⌐ or ⌐

7) a) $5(x-1)^3+1=-4$

$-1\ -1$

$5(x-1)^3=-5$

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

$(x-1)=-1$

$x=0$

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

$2\left(\frac{3\sqrt{x+4}}{2}\right)=\left(\frac{3}{2}\right)\cdot 2$

$3\sqrt{x+4}=3$

$x+4=27$

$x=23$

7c) $3\sqrt[3]{x-4}+2=5$

$-2 \quad -2$

$\frac{3\sqrt[3]{x-4}}{3}=\frac{3}{3}$

$(\sqrt[3]{x-4})^3=(1)^3$

$x-4=1$

$x=5$

d) Same order. SADMEP.

8a) $|x-6|-2=14$

$+2 \quad +2$

$|x-6|=16$

$x-6=16$ → $x=22$

$x-6=-16$ → $x=-10$

b) $5|x+3|+1=26$

$-1 \quad -1$

$\frac{5|x+3|}{5}=\frac{25}{5}$

$|x+3|=5$

$x+3=5$ → $x=2$

$x+3=-5$ → $x=-8$

c) $\frac{2}{-2}-3|x+11|=\frac{18}{-2}$

$\frac{-3|x+11|}{-3}=\frac{-15}{-3}$

$|x+11|=5$

$x+11=5$ → $x=-6$

$x+11=-5$ → $x=-16$

d) $\frac{2|x+3|}{2}=\frac{6x}{2}$

$|x+3|=3x$

$x+3=3x$

$3=2x$

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

$x+3=-3x$

$3=-4x$

$-\frac{3}{4}=x$