11.3A HW

Tuesday, May 20, 2014
11:00 AM

p. 732) 3-13, 21, 28

③ 4 ④ $\frac{81}{4}$ ⑤ 48 ⑥ $\emptyset$ ⑦ 29 ⑧ 12

⑨ 8 ⑩ $\frac{109}{9}$ ⑪ $-\frac{75}{2}$ ⑫ 7 ⑬ 47 ㉑ B

㉘ $x=27$ is an extraneous solution. There are no real solutions

Solution

③ $3\sqrt{x}-6=0$
$+6\ \ +6$
$\frac{3\sqrt{x}}{3}=\frac{6}{3}$
$(\sqrt{x})^2=2^2$
$x=4$

check!
$3\sqrt{4}-6=0$
$3\cdot 2-6=0$
$0=0$ ✓

④ $2\sqrt{x}-9=0$
$+9\ \ +9$
$\frac{2\sqrt{x}}{2}=\frac{9}{2}$
$(\sqrt{x})^2=(\frac{9}{2})^2$
$x=\frac{81}{4}$

check!
$2\sqrt{\frac{81}{4}}-9=0$
$2\cdot\frac{9}{2}-9=0$
$9-9=0$
$0=0$ ✓

⑤ $\sqrt{3x}+4=16$
$-4\ \ -4$
$(\sqrt{3x})^2=(12)^2$
$\frac{3x}{3}=\frac{144}{3}$
$x=48$

check!
$\sqrt{3\cdot 48}+4=16$
$\sqrt{144}+4=16$
$12+4=16$
$16=16$ ✓

⑥ $\sqrt{5x}+5=0$
$-5\ \ -5$
$(\sqrt{5x})^2=(-5)^2$
$\frac{5x}{5}=\frac{25}{5}$
$x=5$
no real solution

check!
$\sqrt{5(5)}+5=0$
$\sqrt{25}+5=0$
$5+5=0$
$10\neq 0$
NO!

⑦ $\sqrt{x+7}+5=11$
$-5\ \ -5$
$(\sqrt{x+7})^2=6^2$
$x+7=36$
$-7\ \ -7$
$x=29$

check!
$\sqrt{29+7}+5=11$
$\sqrt{36}+5=11$
$6+5=11$
$11=11$ ✓

⑧ $\sqrt{x-8}-4=-2$
$+4\ \ +4$
$(\sqrt{x-8})^2=2^2$
$x-8=4$
$+8\ \ +8$
$x=12$

check!
$\sqrt{12-8}-4=-2$
$\sqrt{4}-4=-2$
$2-4=-2$
$-2=-2$ ✓

⑨ $2\sqrt{x-4}-2=2$
$+2\ \ +2$

check!
$2\sqrt{8-4}-2=2$

⑩ $3\sqrt{x-1}-5=5$
$+5\ \ +5$

check!
$3\sqrt{109-1}-5=5$

(9) $2\sqrt{x-4}-2=2$
$+2\ +2$
$\frac{2\sqrt{x-4}}{2}=\frac{4}{2}$
$(\sqrt{x-4})^2=2^2$
$x-4=4$
$+4\ +4$
$\boxed{x=8}$

check!
$2\sqrt{8-4}-2=2$
$2\sqrt{4}-2=2$
$2\cdot 2-2=2$
$4-2=2$
$2=2$ ✓

(10) $3\sqrt{x-1}-5=5$
$+5\ +5$
$\frac{3\sqrt{x-1}}{3}=\frac{10}{3}$
$(\sqrt{x-1})^2=(\frac{10}{3})^2$
$x-1=\frac{100}{9}$
$+1\ +1$
$\boxed{x=\frac{109}{9}}$

check!
$3\sqrt{\frac{109}{9}-1}-5=5$
$3\sqrt{\frac{100}{9}}-5=5$
$3\cdot\frac{10}{3}-5=5$
$10-5=5$
$5=5$ ✓

(11) $\sqrt{6-2x}+12=21$
$-12\ -12$
$(\sqrt{6-2x})^2=9^2$
$6-2x=81$
$-6\ \ -6$
$\frac{-2x}{-2}=\frac{75}{-2}$
$\boxed{x=-\frac{75}{2}}$

check!
$\sqrt{6-2(-\frac{75}{2})}+12=21$
$\sqrt{6+75}+12=21$
$\sqrt{81}+12=21$
$9+12=21$
$21=21$ ✓

(12) $5\sqrt{x-3}+4=14$
$-4\ -4$
$\frac{5\sqrt{x-3}}{5}=\frac{10}{5}$
$(\sqrt{x-3})^2=2^2$
$x-3=4$
$+3\ +3$
$\boxed{x=7}$

check!
$5\sqrt{7-3}+4=14$
$5\sqrt{4}+4=14$
$5\cdot 2+4=14$
$14=14$ ✓

(13) $2\sqrt{x-11}-8=4$
$+8\ +8$
$\frac{2\sqrt{x-11}}{2}=\frac{12}{2}$
$(\sqrt{x-11})^2=6^2$
$x-11=36$
$+11\ +11$
$\boxed{x=47}$

check!
$2\sqrt{47-11}-8=4$
$2\sqrt{36}-8=4$
$2\cdot 6-8=4$
$4=4$ ✓

(21) $10\sqrt{x+3}+3=18$
$-3\ -3$
$\frac{10\sqrt{x+3}}{10}=\frac{15}{10}$
$(\sqrt{x+3})^2=(\frac{3}{2})^2$
$x+3=\frac{9}{4}$
$-3\ \ -3$

check!
$10\sqrt{-\frac{3}{4}+3}+3=18$
$10\sqrt{\frac{9}{4}}+3=18$
$\overset{5}{\cancel{10}}\cdot\frac{3}{\cancel{2}}+3=18$
$5\cdot 3+3=18$
$18=18$ ✓

$x + 3 - \frac{1}{4}$

$-3 \quad -3$

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

$5 \cdot 3 + 3 = 18$

$18 = 18$ ✓