Transitions to College Mathematics
1.6 Extra Practice

Name Key

SHOW ALL WORK!

1. Solve. $\sqrt{2x+2}=2$

A. 1
B. 0
C. -1
D. No solution

$2x+2=4$
$2x=2$
$x=1$

$\sqrt{2(1)+2} \stackrel{?}{=} 2$
$\sqrt{4}=2$ ✓

2. Solve. $\sqrt{5x+1}-1=3x$

A. $0,\frac{-1}{9}$
B. $0,\frac{1}{9}$
C. 0
D. No Solution

$(\sqrt{5x+1})^2=(3x+1)^2$
$5x+1=9x^2+6x+1$
$0=9x^2+x$
$0=x(9x+1)$
$x=0$ $\quad 9x+1=0$
$9x=-1$
$x=-1/9$

$\sqrt{5(0)+1}-1=3(0)$
$1-1=0$ ✓

$\sqrt{5(-1/9)+1}-1=3(-1/9)$
$\sqrt{-5/9+9/9}-1=-1/3$
$\sqrt{4/9}-1=-1/3$
$2/3-1=-1/3$

3. Solve. $|x+5|=1-3x$

A. 3
B. -1
C. -1, 3
D. No Solution

$|x+5|^2=(1-3x)^2$
$x^2+10x+25=1-6x+9x^2$
$0=8x^2-16x-24$
$0=x^2-2x-3$
$0=(x-3)(x+1)$
$x=3$ $\quad x=-1$

$|3+5|=1-3(3)$
$|8|\neq 1-9$

$|-1+5|=1-3(-1)$
$|4|=1+3$

4. Solve. $|9x-1| = x-9$

A. -1, 1
B. 1
C. -1
D. No Solution

$|9x-1|^2 = (x-9)^2$

$81x^2 - 18x + 1 = x^2 - 18x + 81$

$80x^2 - 80 = 0$

$80(x^2-1) = 0$

$80(x+1)(x-1) = 0$

$x = -1 \quad x = 1$

$|9(-1)-1| = (-1)-9$

$|-9-1| \neq -10$

$|9(1)-1| = 1-9$

$|8| \neq -8$

5. Solve. $10x^{-2} + 2x^{-1} + 1 = 0$

A. $-1 \pm \sqrt{11}$
B. $1 \pm \sqrt{11}$
C. $-1 \pm 3i$
D. $1 \pm 3i$

let $u = x^{-1}$

$u^2 = x^{-2}$

$10u^2 + 2u + 1 = 0$

$10u^2 + 2u = -1$

$\left(\frac{1}{5} \cdot \frac{1}{2}\right)^2 = \left(\frac{1}{10}\right)^2$

$u^2 + \frac{1}{5}u + \frac{1}{100} = -\frac{1}{10} + \frac{1}{100}$

$\left(u + \frac{1}{10}\right)^2 = -\frac{10}{100} + \frac{1}{100}$

$\left(u + \frac{1}{10}\right)^2 = -\frac{9}{100}$

$u + \frac{1}{10} = \pm\sqrt{-\frac{9}{100}}$

$u = -\frac{1}{10} \pm \frac{3i}{10}$

$u = \frac{-1 \pm 3i}{10}$ $\quad u = \frac{-1-3i}{10}$

$\frac{1}{x} = \frac{-1+3i}{10}$ $\quad \frac{1}{x} = \frac{-1-3i}{10}$

$x = \frac{10}{-1+3i}$ $\quad x = \frac{10}{-1-3i}$

$x = \frac{10}{-1+3i} \cdot \frac{-1-3i}{-1-3i}$

$= \frac{10-30i}{1-9i^2}$

$= \frac{10-30i}{10}$

$= -1-3i$

$x = \frac{10}{-1-3i} \cdot \frac{-1+3i}{-1+3i}$

$= \frac{10+30i}{1-9i^2}$

$= \frac{10+30i}{10}$

$= -1+3i$