M3H U3 Day 7 HW Solving Rational and Radical Equations Answer Key

I. Solve algebraically – show all your work.

11) $4b^{-\frac{3}{4}} + 10 = \frac{21}{2}$

$\left(b^{-\frac{3}{4}}\right)^{-\frac{4}{3}} = \left(\frac{1}{8}\right)^{-4/3}$

$b = 16$

13) $-54 = 10 - (m-10)^{\frac{3}{2}}$

$-64 = -(m-10)^{\frac{3}{2}}$

$64 = (m-10)^{\frac{3}{2}}$

$(64)^{\frac{2}{3}} = \left((m-10)^{\frac{3}{2}}\right)^{\frac{2}{3}}$

$16 = m-10$

$26 = m$

15) $9 + 5\sqrt[3]{2m} = 29$

$5\sqrt[3]{2m} = 20$

$\sqrt[3]{2m} = 4$

$\left(\sqrt[3]{2m}\right)^3 = (4)^3$

$2m = 64$

$m = 32$

17) $-646 = -3(65-n)^{\frac{3}{2}} + 2$

$-648 = -3(65-n)^{\frac{3}{2}}$

$(216)^{\frac{2}{3}} = \left((65-n)^{\frac{3}{2}}\right)^{\frac{2}{3}}$

$36 = 65-n$

$n = 29$

21) $\sqrt{4n+8} = n+3$

$\left(\sqrt{4n+8}\right)^2 = (n+3)^2$

$4n+8 = n^2+6n+9$

$0 = n^2+2n+1$

$0 = (n+1)(n+1)$

$n = -1$ ✓

23) $4 + \sqrt{-3m+10} = m$

$\sqrt{-3m+10} = m-4$

$-3m+10 = (m-4)^2$

$-3m+10 = m^2-8m+16$

$0 = m^2-5m+6$

$0 = (m-6)(m+1)$

$m = 6$ $m = -1$ no solution

25) $n-7 = \sqrt{3n-21}$

$(n-7)^2 = \left(\sqrt{3n-21}\right)^2$

$n^2-14n+49 = 3n-21$

$n^2-17n+70 = 0$

$(n-10)(n-7) = 0$

$n = 10$ ✓ $n = 7$ ✓

27) $-3 + \sqrt{m+59} = m$

$\sqrt{m+59} = m+3$

$\left(\sqrt{m+59}\right)^2 = (m+3)^2$

$m+59 = m^2+6m+9$

$0 = m^2+5m-50$

$0 = (m+10)(m-5)$

$m = -10$ extraneous $m = 5$ ✓