MAT 055 Practice Test Chapter 17

All test answers are to be in simplest form. A calculator may be used.
Cell phones, iPads, and other electronic devices with scanning or photo ability may NOT be used.
No notes, no books, no homework may be used while taking this test.

Simplify the expression. If any variables are present, assume that they are positive.

1) $\sqrt[3]{64}$ = 4

2) $-\sqrt[4]{4096}$ = −8

3) $\sqrt{x^4}$ = x^2

4) $\sqrt[4]{256x^8}$ = $4x^2$

5) $\sqrt{(8x+24)^2}$ = 8x + 24

Write the expression in radical notation.
Do not simplify the radical expression.

6) $6^{1/2}$ = $\sqrt{6}$

7) $x^{5/2}$ = $\sqrt{x^5}$ or $(\sqrt{x})^5$

8) $p^{-4/5}$ = $\frac{1}{p^{4/5}} = \frac{1}{\sqrt[5]{p^4}}$

9) $(9m+n)^{6/7}$ = $\sqrt[7]{(9m+n)^6}$

Write the expression using rational exponents.

10) $\sqrt{x^9}$ = $x^{9/2}$

11) $\sqrt[2]{x^5}$ = $x^{5/2}$

12) $\frac{1}{\sqrt[4]{11^3}}$ = $11^{-3/4}$

13) $\sqrt[8]{(3n-9)^9}$ = $(3n-9)^{9/8}$

Simplify the expression.
Assume that all variables are positive.

14) $\sqrt[4]{\frac{t^{12}}{z^8}} = \frac{\sqrt[4]{t^{12}}}{\sqrt[4]{z^8}} = \frac{t^3}{z^2}$

15) $\left(\frac{x^6}{y^9}\right)^{-1/3} = \frac{x^{-2}}{y^{-3}} = \frac{y^3}{x^2}$

16) $\frac{\sqrt[3]{270a^7z^2}}{\sqrt[3]{10a^5z}} = \sqrt[3]{\frac{270a^7z^2}{10a^5z}} = 3\sqrt[3]{a^2z}$

17) $\sqrt{15x^3}\cdot\sqrt{15x^5}$ = $15x^4$

18) $\sqrt[3]{27x^3}\cdot\sqrt[3]{125x^3}$ = $15x^2$

19) $\sqrt{3}(\sqrt{7}+\sqrt{5})$ = $\sqrt{21}+\sqrt{15}$

20) $(\sqrt{10}+1)(\sqrt{10}-1)$ = 10 − 1 = 9

21) $(\sqrt{6x}+y)(\sqrt{6x}-y)$ = $6x - y^2$

22) $\sqrt{49}-\sqrt{100}$ = 7 − 10 = −3

23) $11\sqrt{11}-20\sqrt{11}$ = $-9\sqrt{11}$

24) $2\sqrt{3}+2\sqrt{12}$ = $2\sqrt{3}+4\sqrt{3}=6\sqrt{3}$

25) $\sqrt{5x}+6\sqrt{180x}+3\sqrt{125x}$ = $52\sqrt{5x}$
($\sqrt{36}\cdot\sqrt{5x}$ $\sqrt{25}\cdot\sqrt{5x}$)

26) $6\sqrt{32x^2}-3\sqrt{18x^2}-\sqrt{2x^2}$ = $14x\sqrt{2}$
($\sqrt{16x^2}\cdot\sqrt{2}$ $\sqrt{9x^2}\cdot\sqrt{2}$ $\sqrt{x^2}\cdot\sqrt{2}$)

27) $11\sqrt[4]{x^7}-3x\sqrt[4]{x^3}$ = $11x\sqrt[4]{x^3}-3x\sqrt[4]{x^3}$
$8x\sqrt[4]{x^3}$

28) $4\sqrt[3]{8x}+4\sqrt[3]{27x}$ = $20\sqrt[3]{x}$
$8\sqrt[3]{x}+12\sqrt[3]{x}$

Rationalize the denominator

29) $\frac{8}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{8\sqrt{3}}{3}$

30) $\sqrt{\frac{98}{x}} = \frac{7\sqrt{2x}}{x}$

31) $\frac{3z}{\sqrt{13}} = \frac{3z\sqrt{13}}{13}$

32) $\frac{\sqrt{5}}{\sqrt{7}+2} = \frac{\sqrt{35}-2\sqrt{5}}{3}$

33) $\frac{5}{6-\sqrt{7}} = \frac{30+5\sqrt{7}}{29}$

34) $\frac{10-\sqrt{3}}{10+\sqrt{3}} = \frac{103-20\sqrt{3}}{97}$

Solve the equation.

35) $\sqrt{x+1} = 4$ $x = 15$

36) $\sqrt{2x} = -4$ No Real solution

37) $\sqrt{x+4} - 5 = 0$ $x = 21$

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

39) $\sqrt[3]{x+1} + 4 = 0$ $x = -65$

40) $\sqrt{2x-3} = 3 - x$ ~~$x = 6$~~ $x = 2$ extraneous

41) $\sqrt{9x-11} = \sqrt{x+12}$ $x = \frac{23}{8}$

Use the imaginary unit to write the expression.

42) $\sqrt{-256} = 16i$

43) $\sqrt{-270} = 3i\sqrt{30}$

Write the expression in standard form, a + bi.

44) $(4 - 3i) + (5 + 6i) = 9 + 3i$

45) $(6 + 6i) - (-3 + i) = 9 + 5i$

46) $(-9 + 5i) - 4 = -13 + 5i$

47) $7i + (-6 - i) = -6 + 6i$

48) $7i(6 - 2i) = 42i - 14i^2 = +14 + 42i$ (-1)

49) $(5 - 2i)(7 + 8i) = 51 + 26i$

50) $\frac{7}{2i} = -\frac{7}{2}i$

51) $\frac{8}{8+7i} = \frac{64}{113} - \frac{56}{113}i$

52) $\frac{5i}{-4+9i} = \frac{45}{97} - \frac{20}{97}i$

53) $\frac{2+3i}{9-3i} = \frac{1}{10} + \frac{11}{30}i$

54) $\frac{1-8i}{5-3i} = \frac{29}{34} - \frac{37}{34}i$

Simplify the power of i.

55) $i^8 = 1$

56) $i^{19} = -i$

57) $i^{21} = i$

58) $i^{22} = -1$