2.2 HW

1. For each of the following expressions, find at least three equivalent expressions. Which do you consider to be the simplest? <u>Homework Help</u> ✎

    a. $(2x-3)^2 + 5$

    b. $(\frac{3x^2y}{x^3})^4$

2. Match each expression on the left with its equivalent expressions on the right. Assume that all variables represent positive values. Be sure to justify how you know each pair is equivalent. <u>Homework Help</u> ✎

  a. $\sqrt{4x^2y^4}$ 1. $2x\sqrt{y}$

  b. $\sqrt{8x^2y}$ 2. $2y\sqrt{2x}$

  c. $\sqrt{4x^2y}$ 3. $2xy^2$

  d. $\sqrt{16xy^2}$ 4. $2x\sqrt{2y}$

  e. $\sqrt{8xy^2}$ 5. $4y\sqrt{x}$

3. Bonnie and Dylan were both working on simplifying the expression at right. $(\frac{2x^5y^4}{8xy^3})^3$ Each of their first steps is shown below. <u>Homework Help</u> ✎

    Bonnie: $\frac{8x^{15}y^{12}}{512x^3y^9}$ Dylan: $(\frac{x^4y}{4})^3$

Each of them is convinced that they have started the problem correctly. Has either of them made an error? If so, explain the error completely. If not, explain how they can both be correct and verify that they will get the same, correct solution. Which student's method do you prefer? Why?

4. Solve this system for m and b: <u>Homework Help</u> ✎

        $342 = 23m + b$
        $147 = 10m + b$

5. Consider the sequence 3, 9, … <u>Homework Help</u> ✎
a.   Assuming that the sequence is arithmetic, find the next four terms of the sequence and then write an equation for $t(n)$.
b.   Assuming that the sequence is geometric, find the next four terms of the sequence and then write an equation for $t(n)$.

Read below before doing Problem 6.

Fractional Exponents

But what if the exponent is a fraction?

An exponent of $^1/_2$ is actually **square root**

$$4^{\frac{1}{2}} = \sqrt{4}$$

And an exponent of $^1/_3$ is **cube root**

$$4^{\frac{1}{3}} = \sqrt[3]{4}$$

An exponent of $^1/_4$ is **4th root**

$$4^{\frac{1}{4}} = \sqrt[4]{4}$$

And so on!

etc...

A fractional exponent like **m/n** means:

   Do the **m-th power**, then take the **n-th root**

$$x^{\frac{m}{n}} = \sqrt[n]{x^m}$$
$$= \left(\sqrt[n]{x}\right)^m$$

OR Take the **n-th root** and then do the **m-th power**

6. Simplify each expression without using a calculator. <u>Homework Help</u> ✎
a. $25^{-1/2}$
b. $\left(\frac{1}{27}\right)^{-1/3}$
c. $9^{3/2}$
d. $16^{-3/4}$

Answer Key

1. See below:
  a. $4x^2 - 12x + 14$

  b. $\dfrac{81y^4}{x^4}$

2. See below:
  a. 3
  b. 4
  c. 1
  d. 5
  e. 2

3. They are both correct: $\dfrac{x^{12}y^3}{64}$. Preferences vary.

4. $m = 15, b = -3$

5. See below:
  a. 15, 21, 27, 33, $t(n) = 6n - 3$
  b. 27, 81, 243, 729, $t(n) = 3^n$

6. See below:
  a. $\dfrac{1}{5}$
  b. 3
  c. 27
  d. $\dfrac{1}{8}$