Question 1

Perform the following operation by applying the laws of exponents. Make sure your answer contains only positive exponents. Show all steps to the solution.

$$\left(16a^2b^{-3}\right)^2 \div \left(4b^2a^3\right)^{-\frac{2}{3}}$$

Question 2

Perform the following operation by applying the laws of exponents. Make sure your answer contains only positive exponents. Show all steps to the solution.

$$\left(m^{-3}n^4o^2\right)^{\frac{3}{4}} \times \left(m^2n^{-2}o^{-4}\right)^{-1}$$

Question 3

Perform the following operation by applying the laws of exponents. Make sure your answer contains only positive exponents. Show all steps to the solution.

$$\left(\frac{x^3}{4}\right)\times\left(\frac{16}{x}\right)^{-2}$$

Question 4

Perform the following operation by using scientific notation and the laws of exponents. Express your answer using scientific notation. Show all steps to the solution.

$$\left(\frac{6.2\times10^6}{0.008}\right)$$

Question 5

Simplify the following expression. Make sure your answer contains only positive exponents. Show all the steps in the solution.

$$\left(\frac{x^3y^5z^{-2}}{27x^{-2}y^7z}\right)^{-\frac{3}{2}}$$

Question 6

Determine if the following two expressions are equivalent by applying the laws of exponents. Show all steps to your solution.

$$\left(\frac{16}{125}\right)^{-3}\times\left(\frac{25}{8}\right)^{2}\times\left(\frac{5}{2}\right)^{4} \text{ and } \left(\frac{625}{64}\right)^{-1}\times\left(\frac{256}{625}\right)^{-\frac{1}{4}}\times\left(\frac{2}{5}\right)^{10}$$

Question 7

If x is an even negative integer, determine if the following statements are true or false by replacing the variable with the number of your choice.

a) $2^x \geq 1$	b) $\left(-\frac{1}{2}\right)^x \leq 4$
c) $\left(\frac{1}{2}\right)^{-x} \leq \frac{1}{2}$	d) $(-2)^x \leq 1$

Question 8

Among the following algebraic expressions, circle those that are equivalent. In the space provided under each expression, show how you arrived at your conclusion.

$-a^2b^6$	$\left(-ab^2\right)^3$	$-\dfrac{b^3}{\left(a^{-2}b^{-9}\right)}$
$-\left(a^4b^{12}\right)^{\frac{1}{4}}$	$\left(ab^3\right)^2$	$-ab^3 \times ab^3$

Question 9

Perform the operations indicated in the expression below and simplify your answer. Show all steps in the solution.

$$\left(3\sqrt{8}+4\right)\bullet\left(-5\sqrt{32}-2\right)$$

Question 10

Perform the operations indicated in the expression below and simplify your answer. Show all steps in the solution.

$$\sqrt{72}-\sqrt{576}+\sqrt{512}$$

Question 11

Perform the operations indicated in the following expression. Simplify your answer and rationalize the denominator, if necessary. Show all steps in the solution.

$$\frac{4\sqrt{2}}{5\sqrt{2}+4}$$

Question 12

Perform the operations indicated in the following expression. Simplify your answer and rationalize the denominator, if necessary. Show all steps in the solution.

$$\left(\frac{-2\sqrt{96}}{\sqrt{27}}\right)$$

Question 13

Determine if the two following expressions are equivalent. Show all the steps in the solution.

$$\left(5-3\sqrt{3}\right)\bullet\left(3\sqrt{3}+5\right)\text{and } 4\sqrt{9}-2\sqrt{49}$$

Question 14

Determine if the two following expressions are equivalent. Show all the steps in the solution.

$$x^{\frac{5}{2}}\sqrt{x^5} \qquad \text{and} \qquad \left(\frac{1}{x^2}\right)^{-2}\sqrt[4]{x^4}$$