1.
Sample: The denominator of the exponent means you must find three equal factors of 2. The index of the radical means the same thing. The numerator of the exponent means to use one of the factors. The exponent under the radical, even though it is not written, is also one.

2. C

3. D

4. A

5. B

6.
$\sqrt{3^3 x^{45} y^{32}} = 3^{\frac{3}{2}} x^{\frac{45}{2}} y^{\frac{32}{2}}$
$3x^{22} y^{16} \sqrt{3x}$

7.
$\sqrt[3]{3^3 x^{45} y^{32}} = 3^{\frac{3}{3}} x^{\frac{45}{3}} y^{\frac{32}{3}}$
$3x^{15} y^{10} \sqrt[3]{y^2}$

8.
Sample: The index in problem 6 is 2. This means that all of the exponents will be divided by 2. In problem 7 the index is 3, so the exponent will be divided by three.

9.
$\sqrt{2^1 \cdot 3^2} - \sqrt{2^1 \cdot 5^2}$
$\left(2^{\frac{1}{2}} \cdot 3^{\frac{2}{2}}\right) - \left(2^{\frac{1}{2}} \cdot 5^{\frac{2}{2}}\right)$
$3\sqrt{2} - 5\sqrt{2}$
$-2\sqrt{2}$

10.

$$\sqrt{2^1 \cdot 3^3} - \sqrt{2^3} + 6\sqrt{2}$$
$$\left(2^{\frac{1}{2}} 3^{\frac{3}{2}}\right) - \left(2^{\frac{3}{2}}\right) + 6\sqrt{2}$$
$$3\sqrt{6} - 2\sqrt{2} + 6\sqrt{2}$$
$$3\sqrt{6} + 4\sqrt{2}$$

11.

$$x^{5+a} = x^2$$
$$5 + a = 2$$
$$a = -3$$

12.

$$\left(2^4\right)^a = 2^1$$
$$2^{4a} = 2^1$$
$$4a = 1$$
$$a = \frac{1}{4}$$

13.

$$c^2 = 4$$
$$c = \pm 2$$

14.

$$\left(\sqrt{\frac{1}{3}d - 2}\right)^2 = (4)^2$$
$$\frac{1}{3}d - 2 = 16$$
$$\frac{1}{3}d = 18$$
$$d = 54$$