Indices - Section Test

(Answers)

1)

$$2^3 \times 2^4 = 2^{4+3} = 2^7$$
$$a = 7$$

2) $(4^4)^2 = 4^{4\times 2} = 4^8$

3) $4^{-3} = \frac{1}{4^3} = \frac{1}{64}$

4) $16^{3/4} = \left(\sqrt[4]{16}\right)^3 = (2)^3 = 8$

5) $\left(\frac{9}{16}\right)^{-3/2} = \left(\frac{16}{9}\right)^{3/2} = \left(\sqrt{\frac{16}{9}}\right)^3 = \left(\frac{4}{3}\right)^3 = \frac{64}{27}$

6) $2^x = 4$
$2^2 = 4$ so $x = 2$

7) $3a^2b \times (2ab^{-2})^3 = 3a^2b \times 8a^3b^{-6}$
$= 24a^5b^{-5}$

8)

$$\frac{16(a^2b^3)^2}{(2ab^2)^3} = \frac{16a^{2\times 2}b^{3\times 2}}{2^3a^3b^{3\times 2}}$$
$$= \frac{16a^4}{8a^3}$$
$$= 2a^{(4-3)}$$
$$= 2a$$

9)

$x^4 - 13x^2 + 36 = 0$
$(x^2 - 4)(x^2 - 9) = 0$
$x^2 = 4$ or $x^2 = 9$
$x = \pm 2$ or $x = \pm 3$

10)

$$4^x = \frac{1}{32}$$
$$4^x = (2^2)^x = 2^{2x}$$
$$\frac{1}{32} = 32^{-1} = \left(2^5\right)^{-1} = 2^{-5}$$
$$2^{2x} = 2^{-5}$$
$$2x = -5$$
$$x = -\frac{5}{2} = -2.5$$