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- (1) Write each of the following as powers of x.

- (a)  $\sqrt{x}$  (b)  $\sqrt[3]{x}$  (c)  $\sqrt[4]{x}$  (d)  $\sqrt[8]{x^5}$

- (e)  $\frac{1}{x}$  (f)  $\frac{1}{x^5}$  (g)  $\frac{1}{\sqrt{x}}$  (h)  $\frac{x^7}{x}$

- (i)  $x\sqrt{x}$  (j)  $x\sqrt[4]{x^7}$  (k)  $\frac{1}{x\sqrt{x}}$  (l)  $\left(\sqrt[6]{x^5}\right)^{0.5}$

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- (2) Solve equation giving your answers as fractions where appropriate. We don't like decimals.
- (a)  $25^{x-1} = 5^{3x+4}$
- (b)  $27^{2x+3} = 9^{1-x}$
- (c)  $16^{2x} = \frac{1}{8^{3-x}}$  (d)  $216^{x-2} = \frac{1}{36^{3-x}}$

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- (3) Given that there are no solutions to the equation  $7^{Ax+4} = 49^{4+Bx}$ , express A in terms of B. (nice question)
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- (4) Solve each equation below giving your answers in exact form:
- (a)  $\sqrt{3}x 4 = \sqrt{6} + x$  (b)  $1 \sqrt{6}x = 2x \sqrt{2}$
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(a) 
$$\sqrt{3}x - 4 = \sqrt{6} + x$$

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 (b)  $1 - \sqrt{6}x = 2x - \sqrt{2}$ 

(5) Solve each equation below:

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(c) 
$$\sqrt{x} - \frac{12}{\sqrt{x}} = 1$$
 (d)  $x^6 + 7x^3 = 8$ 

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