Challenge Worksheet

6:03 | Algebraic Expressions and Indices

Name: _____ Class: _____

Examples

1 Write each of the following without using negative or fractional indices.

a $(x+1)^{-2}$

$= [(x+1)^2]^{-1}$

$= \dfrac{1}{(x+1)^2}$

b $(x+1)^{-\frac{1}{2}}$

$= \left[(x+1)^{\frac{1}{2}}\right]^{-1}$

$= \dfrac{1}{\sqrt{(x+1)}}$

c 2^{-x}

$= (2^x)^{-1}$

$= \dfrac{1}{2^x}$

2 Write each of the following in index form.

a $\dfrac{1}{(2x)^3}$

Let $p = 2x$

$\dfrac{1}{(2x)^3} = \dfrac{1}{p^3}$

$= p^{-3}$

$= (2x)^{-3}$

b $\dfrac{1}{(x+3)^3}$

Let $p = x+3$

$\dfrac{1}{(x+3)^3} = \dfrac{1}{p^3}$

$= p^{-3}$

$= (x+3)^{-3}$

c $\dfrac{1}{\sqrt{e^x+1}}$

Let $p = e^x + 1$

$\dfrac{1}{\sqrt{e^x+1}} = \dfrac{1}{p^{\frac{1}{2}}}$

$= p^{-\frac{1}{2}}$

$= (e^x+1)^{-\frac{1}{2}}$

Exercise

1 Write each of the following without using negative or fractional indices.

a $(x+2)^{-3}$

b $(x+2)^{\frac{1}{2}}$

c $(x+2)^{-\frac{1}{2}}$

d 3^{-x}

e 3^{-2x}

f e^{-x}

g $(e^x+2)^{-1}$

h $(e^{x+2})^{-1}$

i $(e^x+2)^{\frac{1}{2}}$

2 Write each of the following in index form.

a $\sqrt{2x+1}$

b $\sqrt{x^2+1}$

c $\sqrt{e^x}$

d $\dfrac{1}{\sqrt{x}}$

e $\dfrac{1}{(x+2)^2}$

f $\dfrac{1}{\sqrt{x+2}}$

g $x\sqrt{x+1}$

h $\dfrac{x}{\sqrt{x+1}}$

i $\dfrac{x^2}{x+1}$

6:03 Algebraic Expressions and Indices

1 **a** $\frac{1}{(x+2)^3}$ **b** $\sqrt{x+2}$ **c** $\frac{1}{\sqrt{x+2}}$ **d** $\frac{1}{3^x}$ **e** $\frac{1}{3^{2x}}$ **f** $\frac{1}{e^x}$

g $\frac{1}{e^x+2}$ **h** $\frac{1}{e^{x+2}}$ **i** $\sqrt{e^x+2}$

2 **a** $(2x+1)^{\frac{1}{2}}$ **b** $(x^2+1)^{\frac{1}{2}}$ **c** $e^{\frac{1}{2}x}$ or $e^{\frac{x}{2}}$ **d** $x^{-\frac{1}{2}}$ **e** $(x+2)^{-2}$ **f** $(x+2)^{-\frac{1}{2}}$

g $x(x+1)^{\frac{1}{2}}$ **h** $x(x+1)^{-\frac{1}{2}}$ **i** $x^2(x+1)^{-1}$