IB Math Studies 1 BELL WORK

A field is 91.4 m long and 68.5 m wide.

a) Calculate the area of the field in m^2.

b) Calculate the area of the field in cm^2.

c) Express your answer to (b) in the form $a \times 10^k$ where $1 \leq a < 10$ and k is an integer

IB Math Studies 1 BELL WORK

Show that the following are rational numbers:

1. 0.68385 $\frac{68385}{100000}$

2. 0.414141414141... $= x$ $0.7777\ldots$

$\frac{41}{99}$ $41.\overline{41} = 100x$ $\frac{7}{9}$

$41 + x$

Chapter 3

Laws of algebra

A LAWS OF EXPONENTS

The following are **laws of exponents** for $m, n \in \mathbb{Z}$:

$a^m \times a^n = a^{m+n}$	To **multiply** numbers with the **same base**, keep the base and **add** the exponents.
$\dfrac{a^m}{a^n} = a^{m-n}, \ a \neq 0$	To **divide** numbers with the **same base**, keep the base and **subtract** the exponents.
$(a^m)^n = a^{m \times n}$	When **raising** a **power** to a **power**, keep the base and **multiply** the exponents.
$(ab)^n = a^n b^n$	The power of a product is the product of the powers.
$\left(\dfrac{a}{b}\right)^n = \dfrac{a^n}{b^n}, \ b \neq 0$	The power of a quotient is the quotient of the powers.
$a^0 = 1, \ a \neq 0$	Any non-zero number raised to the exponent zero is 1.
$a^{-n} = \dfrac{1}{a^n}$ and $\dfrac{1}{a^{-n}} = a^n$ and in particular $a^{-1} = \dfrac{1}{a}, \ a \neq 0$.	

Simplify

a $k^4 \times k^2$ **b** $5^2 \times 5^6$ **c** $5^9 \div 5^6$ **d** $\frac{m^{10}}{m^4}$

e $(7^6)^d$ **f** $(g^k)^8$ **g** $3^2 \times 3^7 \times 3^4$ **h** $(j^4)^{3x}$

i $11^6 \times 11$ **j** $\frac{z^7}{z^{4t}}$ **k** $(13^c)^{5d}$ **l** $w^{7p} \div w$

Simplify

a $k^4 \times k^2$

k^6

b $5^2 \times 5^6$

5^8

c $5^9 \div 5^6$

5^3

d $\frac{m^{10}}{m^4}$

m^6

e $(7^6)^d$

7^{6d}

f $(g^k)^8$

g^{8k}

g $3^2 \times 3^7 \times 3^4$

3^{13}

h $(j^4)^{3x}$

j^{12x}

i $11^6 \times 11$

11^7

j $\frac{z^7}{z^{4t}}$

z^{7-4t}

k $(13^c)^{5d}$

13^{5cd}

l $w^{7p} \div w$

$\frac{w^{7p}}{w^1}$ w^{7p-1}

Express in simplest form with a prime number base:

a 32 **b** 49 **c** 25^3

d 9^{t+2} **e** 32^{2-r} **f** $\dfrac{81}{3^{y+1}}$

Express in simplest form with a prime number base:

a 32

2^5

b 49

7^2

c 25^3

5^6

d 9^{t+2}

3^{2t+4}

(3^2)

e 32^{2-r}

$(2^5)^{2-r}$

2^{10-5r}

f $\frac{81}{3^{y+1}}$ $\frac{3^4}{3^{y+1}}$

3^{3-y}

$3^{4-(y+1)}$

Write without negative exponents:

a $5n^{-1}$

c $\left(\frac{5}{n}\right)^{-1}$

f $m^{-1}n$

d $\left(\frac{n}{5}\right)^{-2}$

Write without negative exponents:

a $5n^{-1}$

$\frac{5}{n}$

c $\left(\frac{5}{n}\right)^{-1}$

$\frac{n}{5}$

f $m^{-1}n$

$\frac{n}{m}$

d $\left(\frac{n}{5}\right)^{-2}$

$\frac{25}{n^2}$

Simplify using the laws of exponents:

i $5s^2t \times 4t^3$

j $\dfrac{(k^4)^5}{k^3 \times k^6}$

k $\dfrac{12x^2y^5}{8xy^2}$

Simplify using the laws of exponents:

i $5s^2t \times 4t^3$

$20s^2t^4$

j $\dfrac{(k^4)^5}{k^3 \times k^6}$

k^{11}

k $\dfrac{12x^2y^5}{8xy^2}$

$\dfrac{3xy^3}{2}$

Complete Exercise

3 A.2 all numbers d-g.

Expand and simplify:

$(3-2x)^2$ $(3-2x)(3-2x)$

$9-6x-6x+4x^2$ $4x^2-12x+9$

$(3x+1)(3x-1)+(x-7)^2$

$(2+x)(5-x)(3x+1)$

Expand and simplify:

$$(3 - 2x)^2$$

Expand and simplify:

$$(3x+1)(3x-1)+(x-7)^2$$

Expand and simplify:

$$(2+x)(5-x)(3x+1)$$

Assignment:

Review Set 3B