

IGCSE higher

Week 2 homework

1 Simplify

a) $3xy - 12y + 5xy + 8y$

b) $5m^2 + 3mn - 7m + 2m^2 - 9m + 8mn$

c) $5x - 9 + x - 4 - 6x + 10$

2 Expand and Simplify

a) $4(2 + 3x)$

b) $-5(x - 8)$

c) $3a(3+4a)$

d) $6(3x + 7) - 2(5x - 4)$

e) $(a + 5)(a - 2)$

f) $(3a + 6)(a - 4)$

g) $(4c - 5)(2c - 8)$

h) $(x + 7)^2$

i) $5(x + 7)(x - 6)$

j) $(x + 1)(x + 2)(x + 3)$

k) $(2a + 3)(a - 5)(a + 8)$

l) $2(3x + 1) - (2x - 5) + 15$

3 Solve

a) $2x + 1 = 9$

b) $22 = 3x + 7$

c) $5x + 16 = 6$

d) $7(3x + 1) = 112$

e) $7 - 3x = 25$

f) $x/5 = 4$

g) $(x + 2)/3 = 4$

h) $5(x - 2) = 3(x + 6)$

i) $6 - 2x = 27 - 5x$

j) $7x^2 = 63$

k) $10x - 2(3x - 5) = 6$

l) $(x^2 + 4)/5 = 4$

4 Solve the inequalities & represent on a number line

a) $3a + 2 \leq 14$

b) $6 - 2x > 14$

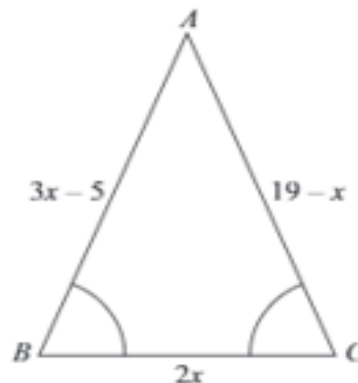
c) $-18 < 4x - 2 \leq 6$

5 ABC is a triangle

Angle ABC = angle BCA

Work out the perimeter of the triangle

Give your answer as a number of centimetres



6 If $a = -3$ and $b = 5$ work out

a) $a - b$

b) $b - a$

c) $2a + 3b$

d) $10b - 7a$

e) $4a^2$

f) ba^3

7 A rectangular field has a perimeter of 150m the length of the field is 15m longer than the width, the width of the field is x , use this information to form an equation and solve it to find the length x . Now work out the area of the field

8 Simplify

a) $5w^{16} \times 7w^4$

b) $5a^6 \div a^3$

c) $24r^7 \div 8r^8$

d) $3a^2b^3 \times 4ab^2$

e) $a^{15} \times a^6 \div a^3$

f) $16a^{-13} \div 2a^{-15}$

g) $(g^6)^{-4}$

h) $(2b^7)^3$

9 Evaluate these without using a calculator write answers as fractions where necessary

Remember the difference between negative indices

a) 4^{-2}

b) 7^{-2}

c) 9^{-1}

d) 11^{-2}

e) 5^{-3}

f) 2^{-5}

and fractional indices

g) $9^{1/2}$

h) $36^{1/2}$

i) $81^{1/2}$

j) $27^{1/3}$

k) $64^{1/3}$

l) $16^{1/4}$

10 Without using a calculator, evaluate these and where appropriate leave the answer as a fraction

- a) $16^{1/2}$ b) 4^{-3} c) $100^{1/2}$ d) 2^{-4} e) $8^{1/3}$ f) $125^{1/3}$
g) $169^{1/2}$ h) 15^{-2} i) $25^{-1/2}$ j) $27^{-1/3}$ k) $49^{-1/2}$ l) $(5^6)^{-1/2}$
m) $(3/4)^2$ n) $(2/5)^3$ o) $(25/64)^{1/2}$ p) $(4/9)^{-1/2}$ q) $(125/27)^{-1/3}$

11 Work out the value of n

- a) $4^n = 16$ b) $3^n = 1/9$ c) $2^n = 1/8$ d) $2^n = 1/32$
e) $3^7 \times 3^{-9} = 3^n$ f) $9 \div 3^5 = 3^n$ g) $2^{11} \div 8^2 = 2^n$ h) $25^2 \times 5^7 = 5^n$

12 Evaluate these, remember to split the fractional indices

- $4^{3/2} \longrightarrow (4^{1/2})^3 \longrightarrow 2^3 \longrightarrow 8$
a) $8^{2/3}$ b) $16^{3/2}$ c) $4^{-3/2}$ d) $64^{-2/3}$ e) $1000^{2/3}$ r) $16^{-3/4}$

13 Simplify and express in standard form

$$(8 \times 10^{27})^{1/3}$$

14 Simplify

$$\left(1 \frac{7}{9}\right)^{1\frac{1}{2}}$$

hint: convert mixed numbers to top heavy numbers

15 Express $3^{-2} \times (9^3)^{1/3} \times 27$ as a power of 3

16 Work out the exact value of x $16^{1/5} \times 2^x = 8^{2/5}$

18 Solve

a) $\frac{5x-8}{3} = 4x+2$

b) $\frac{4(8x-2)}{3x} = 10$

c) $\frac{7-3f}{4} = 2$