Surds - Lesson 3

Simplifying Surds 3 - Multiplying Brackets

<u>LI</u>

- Simplify surds using the 1st and 2nd Rules of Surds.

<u>SC</u>

- 1st and 2nd Rules of Surds.

- Expanding Brackets (Foil).

Mar 15-08:05

<u>Example 1</u>

Multiply the brackets and simplify :

$$\sqrt{3}\left(7 - \sqrt{3}\right)$$

$$= \sqrt{3} \times 7 - \sqrt{3} \times \sqrt{3}$$

$$= \boxed{7\sqrt{3} - 3}$$

<u>Example 2</u>

Multiply the brackets and simplify :

$$\sqrt{18} \left(\sqrt{2} - \sqrt{3} \right)$$

$$= \sqrt{9 \times 2} \left(\sqrt{2} - \sqrt{3} \right)$$

$$= 3\sqrt{2} \left(\sqrt{2} - \sqrt{3} \right)$$

$$= 3\sqrt{2} \times \sqrt{2} - 3\sqrt{2} \times \sqrt{3}$$

$$= 3 \times 2 - 3\sqrt{6}$$

$$= \boxed{6 - 3\sqrt{6}}$$

Dec 15-08:28

<u>Example 3</u>

Multiply the brackets and simplify :

$$\left(\sqrt{5} - 2\right)\left(\sqrt{5} + 6\right)$$

$$= \sqrt{5} \times \sqrt{5} + 6 \times \sqrt{5} - 2 \times \sqrt{5} - 12$$

$$= 5 + 6\sqrt{5} - 2\sqrt{5} - 12$$

$$= \boxed{4\sqrt{5} - 7}$$

Dec 15-08:28

1) Multiply the brackets and simplify.

a $\sqrt{2}(3 + \sqrt{2})$ b $\sqrt{5}(\sqrt{5} - 1)$ c $\sqrt{7}(5 - \sqrt{7})$ d $2\sqrt{3}(6 - \sqrt{3})$

e $3(\sqrt{2} - \sqrt{5})$ f $7(\sqrt{3} - 8)$ g $\sqrt{8}(\sqrt{2} - \sqrt{3})$ h $\sqrt{6}(3 - 2\sqrt{2})$

2) Multiply the brackets and simplify.

a $(\sqrt{2} + 1)(\sqrt{2} - 3)$ b $(\sqrt{3} - 2)(\sqrt{3} + 4)$ c $(\sqrt{3} - 5)(\sqrt{3} + 5)$

d $(\sqrt{2} - \sqrt{7})(\sqrt{2} + \sqrt{7})$ e $(\sqrt{5} + 1)^2$ f $(\sqrt{3} - \sqrt{2})^2$

g $(\sqrt{7} - 5)^2$ h $3(\sqrt{5} + 1)(\sqrt{5} + 4)$

3) A rectangle has sides of length $(3 + \sqrt{2})$ cm and $(3 - \sqrt{2})$ cm.
Calculate:

a   the area of the rectangle   b   the length of a diagonal.

Answers

1			2			3		
	a	$3\sqrt{2} + 2$		a	$-1 - 2\sqrt{2}$		a	7 cm^2
	b	$5 - \sqrt{5}$		b	$2\sqrt{3} - 5$		b	$\sqrt{22} \text{ cm}$
	c	$5\sqrt{7} - 7$		c	-22			
	d	$12\sqrt{3} - 6$		d	-5			
	e	$3\sqrt{2} - 3\sqrt{5}$		e	$6 + 2\sqrt{5}$			
	f	$7\sqrt{3} - 56$		f	$5 - 2\sqrt{6}$			
	g	$4 - 2\sqrt{6}$		g	$32 - 10\sqrt{7}$			
	h	$3\sqrt{6} - 4\sqrt{3}$		h	$27 + 15\sqrt{5}$			