

YOU & MATHS Find the real number Find a real number x such that x divided by $\sqrt{2}$ equals the difference between two times x and $7\sqrt{2}$.

To find x we can write the equation:

$$\frac{x}{\sqrt{2}} = 2x - 7\sqrt{2}.$$

We can proceed to doing some calculations and get:

$$\frac{x}{\sqrt{2}} = 2x - 7\sqrt{2}$$

$$x = \sqrt{2}(2x - 7\sqrt{2})$$

$$x = 2\sqrt{2}x - 14$$

$$x(1 - 2\sqrt{2}) = -14$$

$$x(2\sqrt{2} - 1) = 14$$

$$x = \frac{14}{2\sqrt{2} - 1} = \frac{14}{2\sqrt{2} - 1} \cdot \frac{2\sqrt{2} + 1}{2\sqrt{2} + 1} = \frac{14}{7} \cdot (2\sqrt{2} + 1) = 4\sqrt{2} + 2.$$

The result therefore is $x = 4\sqrt{2} + 2$.