

QUESTION 18

$$\sqrt{3b+2} = \sqrt{10-b}$$

Square both sides

$$(\sqrt{3b+2})^2 = (\sqrt{10-b})^2$$

$$\text{Expand } (\sqrt{3b+2})^2 : 3b+2$$

$$(3b+2)^2$$

$$\sqrt{a} = a^{\frac{1}{2}}$$

$$= ((3b+2)^{\frac{1}{2}})^2$$

Apply exponent rule: $(a^b)^c = a^{bc}$

$$= (3b+2)^{\frac{1}{2} \times 2}$$

$$\frac{1}{2} \times 2 = 1$$

$$\frac{1}{2} \times 2$$

Multiply fractions: $a \times \frac{b}{c} = \frac{a \times b}{c}$

$$= \frac{1 \times 2}{2}$$

Cancel the common factor: 2

$$= 1$$

$$= 3b+2$$

$$\text{Expand } (\sqrt{10-b})^2 : 10-b$$

$$(\sqrt{10-b})^2$$

$$\sqrt{a} = a^{\frac{1}{2}}$$

$$= ((10-b)^{\frac{1}{2}})^2$$

Apply exponent rule: $(a^b)^c = a^{bc}$

$$= (10-b)^{\frac{1}{2} \times 2}$$

$$\frac{1}{2} \times 2 = 1$$

$$\frac{1}{2} \times 2$$

Multiply fractions $a \times \frac{b}{c} = \frac{a \times b}{c} = \frac{1 \times 2}{2}$

Cancel common factor 2 = 1

$$= 10-b$$

$$3b+2 = 10-b$$

$$\text{Solve } 3b+2 = 10-b : b=2$$

$$3b+2 = 10-b$$