

Kreuzprodukt und Flächeninhalt

Stufe 1: Kreuzprodukt berechnen

Name: _____

Datum: _____

Kreuzprodukt von $a = (a_1 \mid a_2 \mid a_3)$ und $b = (b_1 \mid b_2 \mid b_3)$: $(a_2 \cdot b_3 - a_3 \cdot b_2 \mid a_3 \cdot b_1 - a_1 \cdot b_3 \mid a_1 \cdot b_2 - a_2 \cdot b_1)$. Der Betrag des Kreuzprodukts ist der Flächeninhalt des Parallelogramms aus a und b , das Dreieck ist halb so groß.

1) $(5 \mid 3 \mid -1) \times (4 \mid 3 \mid -2) =$ _____

2) $(5 \mid 2 \mid 2) \times (4 \mid 3 \mid 4) =$ _____

3) $(2 \mid -2 \mid -5) \times (0 \mid 3 \mid -2) =$ _____

4) $(-4 \mid 0 \mid 2) \times (1 \mid 5 \mid 2) =$ _____

5) $(1 \mid 0 \mid 3) \times (2 \mid -1 \mid -5) =$ _____

6) $(-2 \mid -1 \mid 3) \times (5 \mid 0 \mid -3) =$ _____

7) $(2 \mid 3 \mid -1) \times (5 \mid 3 \mid 4) =$ _____

8) $(-4 \mid 1 \mid -3) \times (-2 \mid -3 \mid 2) =$ _____

9) $(3 \mid -1 \mid 4) \times (2 \mid 3 \mid -1) =$ _____

10) $(-1 \mid -3 \mid 4) \times (-5 \mid 2 \mid 0) =$ _____

Lösungen: Kreuzprodukt und Flächeninhalt

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- 1) $(5 \mid 3 \mid -1) \times (4 \mid 3 \mid -2) = (-3 \mid 6 \mid 3)$
- 2) $(5 \mid 2 \mid 2) \times (4 \mid 3 \mid 4) = (2 \mid -12 \mid 7)$
- 3) $(2 \mid -2 \mid -5) \times (0 \mid 3 \mid -2) = (19 \mid 4 \mid 6)$
- 4) $(-4 \mid 0 \mid 2) \times (1 \mid 5 \mid 2) = (-10 \mid 10 \mid -20)$
- 5) $(1 \mid 0 \mid 3) \times (2 \mid -1 \mid -5) = (3 \mid 11 \mid -1)$
- 6) $(-2 \mid -1 \mid 3) \times (5 \mid 0 \mid -3) = (3 \mid 9 \mid 5)$
- 7) $(2 \mid 3 \mid -1) \times (5 \mid 3 \mid 4) = (15 \mid -13 \mid -9)$
- 8) $(-4 \mid 1 \mid -3) \times (-2 \mid -3 \mid 2) = (-7 \mid 14 \mid 14)$
- 9) $(3 \mid -1 \mid 4) \times (2 \mid 3 \mid -1) = (-11 \mid 11 \mid 11)$
- 10) $(-1 \mid -3 \mid 4) \times (-5 \mid 2 \mid 0) = (-8 \mid -20 \mid -17)$