

Worksheet: Dividing a Polynomial by a Binomial Using Factorization



Q1: Find the value of k that makes the expression $x^2 - kx + 30$ divisible by $x - 5$.

- A -6
- B 1
- C 11
- D -1
- E -11

Q2: Find the value of k that makes the expression $x^2 - kx + 20$ divisible by $x - 5$.

- A -4
- B -1
- C 9
- D 1
- E -9

Q3: Find the value of k that makes the expression $x^2 - kx - 18$ divisible by $x + 2$.

A -9

B 11

C 7

D -11

E -7

Q4: The area of a triangle is $(12x^2 + 38x + 28)$ cm^2 and its base is $(2x + 4)$ cm. Write an expression for its height.

A $(6x + 14)$ cm

B $(12x + 7)$ cm

C $(6x + 7)$ cm

D $(12x + 14)$ cm



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Q5: The area of a triangle is $(18x^2 + 73x + 35)$ cm^2 and its base is $(2x + 7)$ cm. Write an expression for its height.

A $(9x + 10)$ cm

B $(18x + 5)$ cm

C $(9x + 5)$ cm

D $(18x + 10)$ cm



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Q6: The area of a triangle is $(48x^2 + 62x + 9)$ cm^2 and its base is $(8x + 9)$ cm. Write an expression for its height.

- A $(6x + 2)$ cm
- B $(12x + 1)$ cm
- C $(6x + 1)$ cm
- D $(12x + 2)$ cm

Q7: What is the width of a rectangle whose area is $(4x^3 - 32x^2 + 6x^4)$ cm^2 and whose length is $(8x + 3x^2)$ cm?

- A $2x^2$ cm
- B $(2x^2 - 4x)$ cm
- C $(4x^2 - 4x)$ cm
- D $(2x^2 + 4x)$ cm

Q8: What is the width of a rectangle whose area is $(37x^3 + 35x^2 + 6x^4)$ cm^2 and whose length is $(7x + 6x^2)$ cm?

- A x^2 cm
- B $(x^2 + 5x)$ cm
- C $(37x^2 + 5x)$ cm
- D $(x^2 - 5x)$ cm



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Q9: What is the width of a rectangle whose area is $(30x^3 + 15x^2 + 15x^4)$ cm^2 and whose length is $(5x + 5x^2)$ cm ?

A $3x^2$ cm

B $(3x^2 + 3x)$ cm

C $(30x^2 + 3x)$ cm

D $(3x^2 - 3x)$ cm

Q10: By factoring, find all the solutions to $x^3 - x^2 - 14x + 24 = 0$, given that $(x + 4)$ is a factor of $x^3 - x^2 - 14x + 24$.

A $x = -2, x = -3, x = -4$

B $x = 2, x = 3, x = 4$

C $x = 2, x = -3, x = 4$

D $x = -2, x = -3, x = 4$

E $x = 2, x = 3, x = -4$

Q11: A rectangle has an area of $(y^3 + 2y^2 + 5y + 10)$ cm² and a width of $(y + 2)$ cm. Find its length in terms of y and its perimeter when $y = 4$.

- A The length is $(y^2 + 5)$ cm, and the perimeter is 126 cm.
- B The length is $(y + 5)$ cm, and the perimeter is 15 cm.
- C The length is $(y^2 + 5)$ cm, and the perimeter is 54 cm.
- D The length is $(y^2 - 5)$ cm, and the perimeter is 34 cm.
- E The length is $(y + 5)$ cm, and the perimeter is 30 cm.



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Q12: A rectangle has an area of $(y^3 + 10y^2 + 7y + 70)$ cm² and a width of $(y + 10)$ cm. Find its length in terms of y and its perimeter when $y = 2$.

- A The length is $(y^2 + 7)$ cm, and the perimeter is 132 cm.
- B The length is $(y + 7)$ cm, and the perimeter is 21 cm.
- C The length is $(y^2 + 7)$ cm, and the perimeter is 46 cm.
- D The length is $(y^2 + 7)$ cm, and the perimeter is 46 cm.
- E The length is $(y + 7)$ cm, and the perimeter is 42 cm.



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Q13: Knowing that the length of a rectangle is $2x + 5$ and its area is $4x^3 + 10x^2 + 6x + 15$, express the width of the rectangle algebraically.

A $2x^2 - 3$

B $3x^2 + 2$

C $2x^2 + 3$

D $x^2 + 3$

E $3x^2 - 2$

Q14: Knowing that the volume of a box is $10x^3 + 30x^2 - 8x - 24$, its length is 2, and its width is $x + 3$, express the height of the box algebraically.

A $4x^2 - 5$

B $5x^2 - 2$

C $5x^2 + 4$

D $4x^2 + 5$

E $5x^2 - 4$

Q15: $\frac{\dots + 50ab^2 + 38ab}{\dots} = -21ab + 25b + 19.$

A $-40a^2b^2, 2ab$

B $40a^2b^2, 2ab$

C $-42a^2b^2, 2ab$

D $42a^2b^2, -2ab$