

Look over everything you have!

Determine whether each trinomial is a perfect square. If so, factor it. If not, explain why.

1. $16x^2 + 72x + 81$

$2(4x \cdot 9) \checkmark \rightarrow (4x+9)^2$

2. $x^2 - 14x - 49$

$2(x \cdot 7) \checkmark \rightarrow$ but the last term cannot be negative! Not a PST

3. $x^2 - 2x + 1$

$2(x \cdot 1) \checkmark \rightarrow (x-1)^2$

4. $x^6 + 16x^3 + 64$

$2(x^3 \cdot 8) \checkmark \rightarrow (x^3+8)^2$

5. The area of a rectangular frame for Ken's artwork is given by $(25x^2 - 20x + 4)$ cm². The dimensions of the frame are of the form $cx + d$, where c and d are whole numbers. Find an expression for the perimeter of the frame. Find the perimeter when $x = 13$ cm.

area = length · width
area = $25x^2 - 20x + 4 \rightarrow$ PST
 $(5x - 2)^2$
side

$P = 4\text{side} \rightarrow 4(5x - 2) = 20x - 8 \rightarrow x = 13, P = 252 \text{ cm}$

Determine whether each binomial is the difference of perfect squares. If so, factor it. If not, explain why.

6. $9y^2 - 121$

yes, $(3y-11)(3y+11)$

7. $49 - t^6$

yes, $(7-t^3)(7+t^3)$

8. $d^8 - 25$

No, d^8 is not a perfect square!

9. $16p^4 - 100q^2$

yes, $(4p^2+10q)(4p^2-10q)$

10. $x^4y^{10} + 324$

No, cannot have the sum of two squares!

Factor Completely:

11. $6x^2 + 24x$

$6x(x+4)$

12. $3x^2 + 14x + 8 \rightarrow 3x^2 + 12x + 2x + 8$

$= 3x(x+4) + 2(x+4)$

$= (x+4)(3x+2)$

13. $x^2 - 11x + 18 \rightarrow x^2 - 9x - 2x + 18$

$= x(x-9) - 2(x-9)$

$= (x-9)(x-2)$

14. $-5x^2 + 9x + 2$

$-(5x^2 - 9x - 2) \rightarrow 5x^2 - 10x + 1x - 2$

$= 5x(x-2) + 1(x-2)$

$= -(x-2)(5x+1)$

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15. $6d^2 + 17d + 7$

$$6d^2 + 3d + 14d + 7$$

$$3d(2d+1) + 7(2d+1)$$

$$\boxed{(2d+1)(3d+7)}$$

16. $x^2 - 2x - 15$

$$x^2 + 3x - 5x - 15$$

$$x(x+3) - 5(x+3)$$

$$\boxed{(x+3)(x-5)}$$

17. $x^4 - 1$

$$(x^2-1)(x^2+1)$$

$$\downarrow$$

$$\boxed{(x-1)(x+1)(x^2+1)}$$

18. $b^2 + 11b - 42$

$$b^2 - 3b + 14b - 42$$

$$b(b-3) + 14(b-3)$$

$$\boxed{(b-3)(b+14)}$$

19. $n^2 + 50n + 25$

NOT
Factorable!

20. $-30x^2 + 125x - 120$

$$-5(6x^2 - 25x + 24)$$

$$6x^2 - 9x - 16x + 24$$

$$\rightarrow 3x(2x-3) - 8(2x-3)$$

$$\boxed{-5(2x-3)(3x-8)}$$

21. What value of b would make $16x^2 - bx + 25$ a perfect square trinomial?

$$4x \cdot 4x \quad \downarrow \quad 5 \cdot 5$$

$$\downarrow$$

$$2(4x \cdot 5) = \boxed{40x}$$

22. $(n^2 - 3n) + 8n - 24$

$$n(n-3) + 8(n-3)$$

$$\boxed{(n-3)(n+8)}$$

23. $-3x^2 + 5x - 6x + 10$

$$-(3x^2 - 5x + 6x - 10)$$

$$3x(x+2) - 5(x+2)$$

$$\boxed{-(x+2)(3x-5)}$$

24. $12x^2 - 8x - 15$

$$12x^2 - 18x + 10x - 15$$

$$6x(2x-3) + 5(2x-3)$$

$$\boxed{(2x-3)(6x+5)}$$

25. Which of the following is a perfect square trinomial?

- A) $x^2 + 10x + 25$ C) $x^2 + 10x + 20$
B) $x^2 + 5x + 10$ D) $x^2 + 10x + 50$