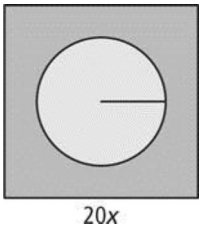
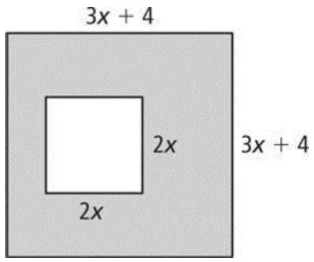
Polynomials Study Guide Name: _____



1. The area of a circle is $81\pi x^2$. What is the area of the shaded region? Write your answer in factored form.

1. _____

2. Find the area of the shaded region.



2. _____

3. The height of a poster is three times its width. You want a 5 inch frame for the poster. Write a variable expression **in factored form** for the area of the frame alone.

3. _____

4. You have a pool that is 11 feet by 17 feet. You want a sidewalk with a uniform width of x to go around the pool. What is the variable expression for the area of the sidewalk **in factored form**?

4. _____

5. A shipping box in the shape of a rectangular prism has a volume of $18x^3 + 5x^2 - 2x$. What are three expressions that can represent possible dimensions of the shipping box?

5. _____

6. A triangle has a base of $(2x - 3)$ and a height of $(3x + 6)$. What is the area of the triangle?

6. _____

7. The area of a television is given by the trinomial $4v^2 + 4v - 15$. The television's length is $2v + 5$. What is the width?

7. _____

8. The perimeter of a rectangle is $8x^2 + 4x - 2$. What is the length of the rectangle if the width is $2x - 1$?

8. _____

9. An isosceles, right triangle has an area of $2x^2 + 8x + 8$. What is the length of one of the congruent sides of the triangle?

9. _____

Simplify each product.

10. $(6t - 5)^2$ _____ **11.** $(7k^2 + 5m)(7k^2 - 5m)$ _____

Factor completely. If the polynomial cannot be factored, write prime.

12. $9t^2 - 49$

13. $36n^2 + 60n + 25$

14. $25t^3 - 20t^2 + 4t$

15. $7y^2 + 11y - 6$

16. $10x^2 - 53x - 11$

17. $112n^2 - 63$

18. $12n^3 - 3n^2 + 16n - 4$

19. $16m^4 - 81$

20. $144x^2 - 72x + 9$

21. $6r^3 + 15r^2 + 8r + 20$

22. $10c^3 - 12c^2 + 15c - 18$

23. $16w^3 + 8w^2 + 28w + 14$

24. $2m^2 + 24m + 70$

25. $4z^2 - 16z + 15$

26. $2y^2 - 8y - 24$

27. Error Analysis Describe and correct the error made in simplifying the product:

$$\mathbf{(2h^2 + 6k)(2h^2 - 6k) = 4k^4 + 24h^2k - 36k^2}$$

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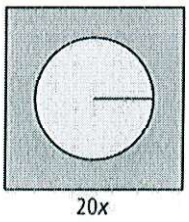
Polynomials Study Guide

Name: Key

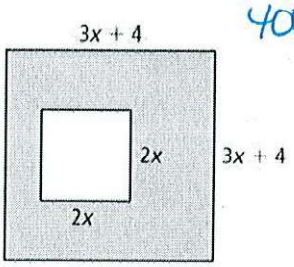


1. The area of a circle is $81\pi x^2$. What is the area of the shaded region? Write your answer in factored form.

$(20x)^2 - 81\pi x^2$

$400x^2 - 81\pi x^2$

1. $x^2(400 - 81\pi)$



2. Find the area of the shaded region.

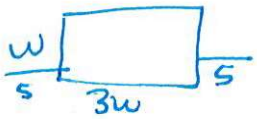
$(3x+4)^2 - (2x)^2$

$9x^2 + 24x + 16 - 4x^2$

$5x^2 + 24x + 16$

2. $5x^2 + 24x + 16$

3. The height of a poster is three times its width. You want a 5 inch frame for the poster. Write a variable expression **in factored form** for the area of the frame alone.



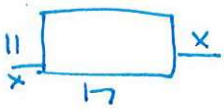
$(3w+10)(w+10) - 3w^2$

$3w^2 + 30w + 10w + 100 - 3w^2$

$40w + 100 = 20(2w+5)$

3. $20(2w+5)$

4. You have a pool that is 11 feet by 17 feet. You want a sidewalk with a uniform width of x to go around the pool. What is the variable expression for the area of the sidewalk **in factored form**?



$(2x+17)(2x+11) - 187$

$4x^2 + 56x + 187$

$4x(x+14)$

4. $4x(x+14)$

5. A shipping box in the shape of a rectangular prism has a volume of $18x^3 + 5x^2 - 2x$. What are three expressions that can represent possible dimensions of the shipping box?

$x(18x^2 + 5x - 2)$

$x(2x+1)(9x-2)$

5. $x(2x+1)(9x-2)$

6. A triangle has a base of $(2x - 3)$ and a height of $(3x + 6)$. What is the area of the triangle?

$\frac{1}{2}(2x-3)(3x+6)$

$6x^2 + 3x - 18$

$3x^2 + \frac{3}{2}x - 9$

6. $3x^2 + \frac{3}{2}x - 9$

7. The area of a television is given by the trinomial $4v^2 + 4v - 15$. The television's length is $2v + 5$. What is the width?

$4x^2 + 4x - 15$

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

7. $2v - 3$

8. The perimeter of a rectangle is $8x^2 + 4x - 2$. What is the length of the rectangle? if the width is $2x - 1$.

$8x^2 + 4x - 2 = 2(l+w)$

$4x^2 + 2x - 1 = l + w$

8. $4x^2$

9. An isosceles, right triangle has an area of $2x^2 + 8x + 8$. What is the length of one of the congruent sides of the triangle?

$b = h$ $\frac{1}{2}b^2 = 2x^2 + 8x + 8$

$= 4x^2 + 16x + 16$

$(2x+4)(2x+4)$

9. $2x + 4$

Simplify each product.

10. $(6t-5)^2$ $36t^2-60t+25$

11. $(7k^2+5m)(7k^2-5m)$ $49k^4-25m^2$

Factor completely. If the polynomial cannot be factored, write prime.

12. $9t^2-49$ $(3t-7)(3t+7)$

13. $36n^2+60n+25$ $(6n+5)(6n+5)$ $(6n+5)^2$

14. $25t^3-20t^2+4t$ $t(25t^2-20t+4)$ $t(5t-2)(5t-2)$ $t(5t-2)^2$

15. $7y^2+11y-6$ $(7y-3)(y+2)$

16. $10x^2-53x-11$ $(5x+1)(2x-11)$

17. $112n^2-63$ $7(16n^2-9)$ $7(4n-3)(4n+3)$

18. $12n^3-3n^2+16n-4$ $3n^2(4n-1)+4(4n-1)$ $(3n^2+4)(4n-1)$

19. $16m^4-81$ $(4m^2-9)(4m^2+9)$ $(4m^2+9)(2m+3)(2m-3)$

20. $144x^2-72x+9$ $9(16x^2-8x+1)$ $9(4x-1)(4x-1)$ $9(4x-1)^2$

21. $6r^3+15r^2+8r+20$ $3r^2(2r+5)+4(2r+5)$ $(3r^2+4)(2r+5)$

22. $10c^3-12c^2+15c-18$ $2c^2(5c-6)+3(5c-6)$ $(2c^2+3)(5c-6)$

23. $16w^3+8w^2+28w+14$ $2(8w^3+4w^2+14w+7)$ $2(4w^2(2w+1)+7(2w+1))$ $2(4w^2+7)(2w+1)$

24. $2m^2+24m+70$ $2(m^2+12m+35)$ $2(m+5)(m+7)$

25. $4z^2-16z+15$ $(2z-3)(2z-5)$

26. $2y^2-8y-24$ $2(y^2-4y-12)$ $2(y+2)(y-6)$

27. Error Analysis Describe and correct the error made in simplifying the product:

$$(2h^2+6k)(2h^2-6k)=4k^4+24h^2k-36k^2$$

$4h^4-12kh^2+12kh^2-36k^2$

① Wrong variable on first term.

② Added a positive $12kh^2$ to a positive $12kh^2$ when they are actually opposites that sum to zero.

The correct answer is: $4h^4-36k^2$