p. 407, #1-24 all

1. $m^2 - 49 = m^2 - 7^2$

$= (m + 7)(m - 7)$

So, $m^2 - 49 = (m + 7)(m - 7)$.

2. $z^2 - 81 = z^2 - 9^2$

$= (z + 9)(z - 9)$

So, $z^2 - 81 = (z + 9)(z - 9)$.

3. $64 - 81d^2 = 8^2 - (9d)^2$

$= (8 + 9d)(8 - 9d)$

So, $64 - 81d^2 = (8 + 9d)(8 - 9d)$.

4. $25 - 4x^2 = 5^2 - (2x)^2$

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

So, $25 - 4x^2 = (5 + 2x)(5 - 2x)$.

5. $225a^2 - 36b^2 = 9(25a^2 - 4b^2)$

$= 9[(5a)^2 - (2b)^2]$

$= 9(5a + 2b)(5a - 2b)$

So, $225a^2 - 36b^2 = 9(5a + 2b)(5a - 2b)$.

6. $16x^2 - 169y^2 = (4x)^2 - (13y)^2$

$= (4x + 13y)(4x - 13y)$

So, $16x^2 - 169y^2 = (4x + 13y)(4x - 13y)$.

7. $12^2 - 9^2 = (12 + 9)(12 - 9)$

$= 21(3)$

$= 63$

So, $12^2 - 9^2 = 63$.

8. $19^2 - 11^2 = (19 + 11)(19 - 11)$

$= 30(8)$

$= 240$

So, $19^2 - 11^2 = 240$.

9. $78^2 - 72^2 = (78 + 72)(78 - 72)$

$= 150(6)$

$= 900$

So, $78^2 - 72^2 = 900$.

10. $54^2 - 52^2 = (54 + 52)(54 - 52)$

$= 106(2)$

$= 212$

So, $54^2 - 52^2 = 212$.

11. $53^2 - 47^2 = (53 + 47)(53 - 47)$

$= 100(6)$

$= 600$

So, $53^2 - 47^2 = 600$.

12. $39^2 - 36^2 = (39 + 36)(39 - 36)$

$= 75(3)$

$= 225$

So, $39^2 - 36^2 = 225$.

13. $h^2 + 12h + 36 = h^2 + 2(h)(6) + 6^2$

$= (h + 6)^2$

So, $h^2 + 12h + 36 = (h + 6)^2$.

14. $p^2 + 30p + 225 = p^2 + 2(p)(15) + 15^2$

$= (p + 15)^2$

So, $p^2 + 30p + 225 = (p + 15)^2$.

15. $y^2 - 22y + 121 = y^2 - 2(y)(11) + 11^2$

$= (y - 11)^2$

So, $y^2 - 22y + 121 = (y - 11)^2$.

16. $x^2 - 4x + 4 = x^2 - 2(x)(2) + 2^2$

$= (x - 2)^2$

So, $x^2 - 4x + 4 = (x - 2)^2$.

17. $a^2 - 28a + 196 = a^2 - 2(a)(14) + 14^2$

$= (a - 14)^2$

So, $a^2 - 28a + 196 = (a - 14)^2$.

18. $m^2 + 24m + 144 = m^2 + 2(m)(12) + 12^2$

$= (m + 12)^2$

So, $m^2 + 24m + 144 = (m + 12)^2$.

19. $25n^2 + 20n + 4 = (5n)^2 + 2(5n)(2) + 2^2$

$= (5n + 2)^2$

So, $25n^2 + 20n + 4 = (5n + 2)^2$.

20. $49a^2 - 14a + 1 = (7a)^2 - 2(7a)(1) + 1^2$

$= (7a - 1)^2$

So, $49a^2 - 14a + 1 = (7a - 1)^2$.

21. The difference of two squares pattern should be used to factor this polynomial.

$n^2 - 64 = n^2 - 8^2$

$= (n + 8)(n - 8)$

So, $n^2 - 64 = (n + 8)(n - 8)$.

22. The perfect square trinomial pattern should be used to factor this polynomial.

$y^2 - 6y + 9 = y^2 - 2(y)(3) + 3^2$

$= (y - 3)^2$

So, $y^2 - 6y + 9 = (y - 3)^2$.

23. $d^2 + 8d + 16 = d^2 + 2(d)(4) + 4^2$

$= (d + 4)^2$

An expression that represents the side length of the coaster is $(d + 4)$ centimeters. Use this expression to find an expression for the perimeter.

$P = 4(s)$

$= 4(d + 4)$

$= 4(d) + 4(4)$

$= 4d + 16$

An expression for the perimeter of the coaster is $(4d + 16)$ centimeters.

24. $A = x^2 - 30x + 225$

$= x^2 - 2(x)(15) + 15^2$

$= (x - 15)^2$

An expression that represents the side length of the playground is $(x - 15)$ feet. Use this expression to find an expression for the perimeter.

$P = 4(s)$

$= 4(x - 15)$

$= 4(x) - 4(15)$

$= 4x - 60$

An expression for the perimeter of the playground is $(4x - 60)$ feet.