

## TutorCraft IB Entrance Prep – Math Skill Builder Worksheet

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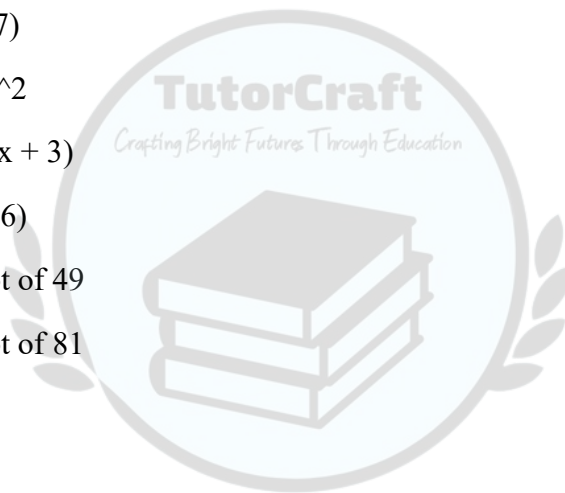
### Part A: Linear Equations / Word Problems (40 Questions)

1. Solve for  $x$ :  $3x + 7 = 25$
2. If  $2x - 5 = 15$ , what is  $x$ ?
3. The sum of twice a number and 9 is 31. Find the number.
4. Solve:  $5x - 12 = 28$
5. If  $3x + 2 = 20$ , find  $x$ .
6. A movie ticket costs \$12. If Amira buys 4 tickets, how much does she pay?
7. If  $7x + 5 = 40$ , find  $x$ .
8. Two more than 3 times a number is 29. What is the number?
9. Solve:  $2x \div 3 = 12$
10. A pen costs \$3 more than a pencil. If the pencil costs  $x$  and the pen costs \$8, find the value of  $x$ .
11. Solve for  $y$ :  $4y - 11 = 21$
12. The sum of two consecutive even numbers is 46. Find the numbers.
13. Solve:  $9 - 2x = 3$
14. A number decreased by 7 is equal to 15. Find the number.
15. If  $4x + 6 = 26$ , solve for  $x$ .
16. A car rental costs \$25 per day plus \$50 insurance. Write and solve an equation for the cost of 7 days.
17. Solve:  $10x - 4 = 76$
18. Three times a number minus 8 is 22. Find the number.
19. Solve for  $x$ :  $12 + 2x = 34$
20. If  $5x \div 2 = 15$ , find  $x$ .
21. A number increased by 12 equals 37. Find the number.
22. Solve:  $6x + 4 = 40$

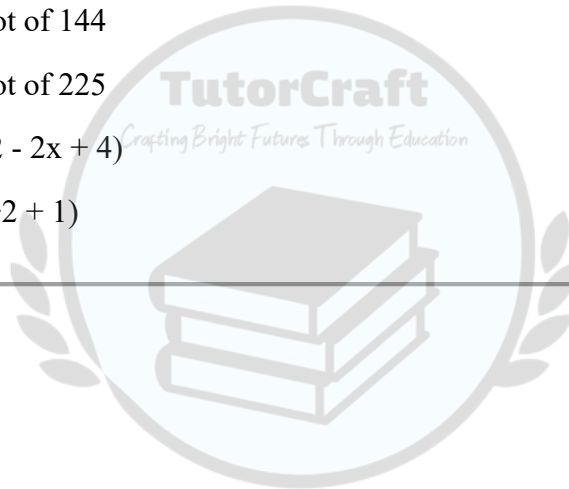
23. The perimeter of a rectangle is 36 cm. If the length is 10 cm and the width is  $x$ , write and solve the equation.
24. Solve:  $7x - 9 = 19$
25. A father is 4 times as old as his son. If the father is 44, how old is the son?
26. Solve:  $3(x + 2) = 21$
27. The difference between a number and 9 is 15. Find the number.
28. Solve:  $15 = 2x + 7$
29. Four less than 9 times a number is 68. Find the number.
30. Solve:  $20 - x = 14$
31. The product of a number and 6 is equal to 54. Find the number.
32. Solve:  $4x - 15 = 29$
33. The sum of three consecutive numbers is 81. Find the numbers.
34. Solve:  $(x \div 4) + 5 = 12$
35. A number times 5 is the same as 45. What is the number?
36. Solve:  $8x + 6 = 70$
37. A taxi charges \$3 plus \$2 per kilometer. If the fare was \$23, how far did the taxi travel?
38. Solve:  $11x - 14 = 40$
39. A student scored 5 more than twice her friend's score. If she scored 31, what did her friend score?
40. Solve:  $3x + 9 = 30$
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**Part B: Algebraic Manipulation (Exponents and Roots) (40 Questions)**

1. Simplify:  $2x + 5x$
2. Expand:  $(x + 3)(x + 2)$
3. Simplify:  $3x - 7x + 2$
4. Expand:  $(2x + 5)(x + 4)$
5. Simplify:  $6a + 3a - 4a$
6. Simplify:  $(x + 2)(x + 2)$
7. Expand:  $(x - 3)(x - 2)$
8. Simplify:  $9x - 4x + 2$
9. Simplify:  $(3x)(2x)$
10. Expand:  $(x + 7)(x - 7)$
11. Simplify:  $4x^2 + 3x^2$
12. Simplify:  $(2x + 3)(2x + 3)$
13. Expand:  $(x + 5)(x + 6)$
14. Simplify: square root of 49
15. Simplify: square root of 81
16. Simplify:  $5x \times 2x$
17. Simplify:  $x^2 \times x^3$
18. Simplify:  $y^3 \times y^2$
19. Simplify: square root of 64
20. Simplify: square root of 121
21. Simplify:  $(x + 2)(x^2 - 2x + 4)$
22. Expand:  $(x + 1)(x^2 + x + 1)$
23. Simplify:  $(3x^2)(2x^3)$
24. Simplify:  $(a^3)(a^2)$
25. Simplify: square root of 16 + square root of 9
26. Simplify: square root of 25  $\times$  square root of 4



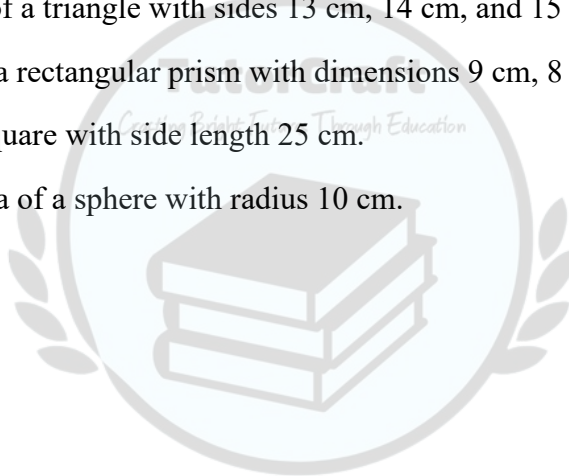
27. Simplify:  $(x + 3)(x + 3)$
28. Simplify:  $(x - 2)(x - 2)$
29. Expand:  $(x + 5)(x - 5)$
30. Simplify:  $(2x)(3x^2)$
31. Simplify:  $m^2 \times m^3$
32. Simplify: square root of 36 - square root of 9
33. Simplify: square root of 100  $\div$  square root of 25
34. Simplify:  $(y + 4)(y - 4)$
35. Expand:  $(2x + 3)(2x - 3)$
36. Simplify:  $(5x^2)(x^3)$
37. Simplify: square root of 144
38. Simplify: square root of 225
39. Expand:  $(x + 2)(x^2 - 2x + 4)$
40. Simplify:  $(x + 1)(x^2 + 1)$



### Part C: Geometry (40 Questions)

1. Find the perimeter of a square with side length 7 cm.
2. Find the area of a rectangle with length 12 cm and width 8 cm.
3. Find the area of a triangle with base 10 cm and height 6 cm.
4. A circle has radius 7 cm. Find its circumference (use  $\pi = 3.14$ ).
5. Find the area of a circle with radius 14 cm.
6. A rectangle has length 15 cm and width 9 cm. Find its perimeter.
7. Find the area of a square with side length 12 cm.
8. Find the volume of a cube with side length 5 cm.
9. Find the volume of a rectangular prism with dimensions 10 cm, 4 cm, and 6 cm.
10. Find the surface area of a cube with side length 8 cm.
11. Find the area of a trapezoid with bases 12 cm and 8 cm, and height 5 cm.
12. Find the perimeter of a triangle with sides 9 cm, 12 cm, and 15 cm.
13. A circle has a diameter of 10 cm. Find its area.
14. Find the volume of a cylinder with radius 3 cm and height 7 cm.
15. Find the surface area of a sphere with radius 6 cm.
16. Find the area of a parallelogram with base 14 cm and height 8 cm.
17. Find the perimeter of a regular hexagon with side length 6 cm.
18. Find the volume of a cone with radius 5 cm and height 12 cm.
19. Find the area of a rhombus with diagonals 10 cm and 8 cm.
20. Find the perimeter of a rectangle with length 20 cm and width 7 cm.
21. Find the area of a square with diagonal 10 cm.
22. A right triangle has legs 9 cm and 12 cm. Find the hypotenuse.
23. Find the surface area of a cylinder with radius 4 cm and height 10 cm.
24. Find the volume of a sphere with radius 7 cm.
25. Find the area of a circle with diameter 16 cm.
26. Find the perimeter of a rectangle with length 30 cm and width 18 cm.

27. Find the volume of a triangular prism with base area  $20 \text{ cm}^2$  and height 12 cm.
28. Find the area of an equilateral triangle with side length 10 cm.
29. Find the volume of a cube with side length 12 cm.
30. Find the circumference of a circle with radius 15 cm.
31. Find the area of a trapezoid with bases 20 cm and 14 cm, and height 9 cm.
32. Find the perimeter of a parallelogram with sides 8 cm and 12 cm.
33. Find the surface area of a cube with side length 10 cm.
34. Find the area of a circle with radius 21 cm.
35. Find the volume of a cone with radius 7 cm and height 9 cm.
36. Find the area of a rhombus with diagonals 12 cm and 16 cm.
37. Find the perimeter of a triangle with sides 13 cm, 14 cm, and 15 cm.
38. Find the volume of a rectangular prism with dimensions 9 cm, 8 cm, and 5 cm.
39. Find the area of a square with side length 25 cm.
40. Find the surface area of a sphere with radius 10 cm.

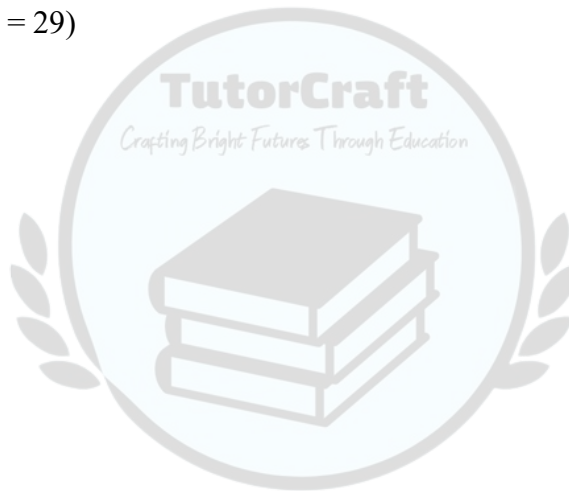


## TutorCraft IB Entrance Prep – Math Skill Builder MARKSCHEME

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### Part A: Linear Equations / Word Problems (40)

1.  $x = 6$
2.  $x = 10$
3. Number = 11 ( $2n + 9 = 31 \rightarrow n = 11$ )
4.  $x = 8$
5.  $x = 6$
6. \$48 ( $12 \times 4$ )
7.  $x = 5$
8. Number = 9 ( $3n + 2 = 29$ )
9.  $x = 18$  ( $2x = 36$ )
10.  $x = 5$  ( $x + 3 = 8$ )
11.  $y = 8$
12. 22 and 24
13.  $x = 3$
14. Number = 22
15.  $x = 5$
16. \$225 ( $25 \times 7 + 50$ )
17.  $x = 8$
18. Number = 10
19.  $x = 11$
20.  $x = 6$
21. Number = 25
22.  $x = 6$
23.  $x = 8$  ( $2(10 + x) = 36$ )
24.  $x = 4$



25. Son = 11 years

26.  $x = 5$

27. Number = 24

28.  $x = 4$

29. Number = 8

30.  $x = 6$

31. Number = 9

32.  $x = 11$

33. 26, 27, 28

34.  $x = 28$

35. Number = 9

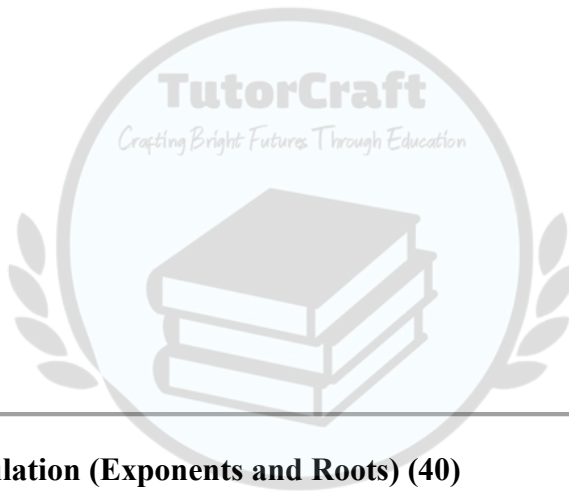
36.  $x = 8$

37. 10 km ( $3 + 2k = 23$ )

38.  $x = 54/11 \approx 4.909$

39. Friend's score = 13

40.  $x = 7$



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### Part B: Algebraic Manipulation (Exponents and Roots) (40)

1.  $7x$

2.  $x^2 + 5x + 6$

3.  $-4x + 2$

4.  $2x^2 + 13x + 20$

5.  $5a$

6.  $x^2 + 4x + 4$

7.  $x^2 - 5x + 6$

8.  $5x + 2$

9.  $6x^2$



10.  $x^2 - 49$

11.  $7x^2$

12.  $4x^2 + 12x + 9$

13.  $x^2 + 11x + 30$

14. 7

15. 9

16.  $10x^2$

17.  $x^5$

18.  $y^5$

19. 8

20. 11

21.  $x^3 + 8$

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

23.  $6x^5$

24.  $a^5$

25. 7

26. 10

27.  $x^2 + 6x + 9$

28.  $x^2 - 4x + 4$

29.  $x^2 - 25$

30.  $6x^3$

31.  $m^5$

32. 3

33. 2

34.  $y^2 - 16$

35.  $4x^2 - 9$

36.  $5x^5$



37. 12

38. 15

39.  $x^3 + 8$

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

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**Part C: Geometry (40)**

1. 28 cm

2.  $96 \text{ cm}^2$

3.  $30 \text{ cm}^2$

4.  $43.96 \text{ cm}$  ( $2 \times 3.14 \times 7$ )

5.  $615.44 \text{ cm}^2$  ( $3.14 \times 14^2$ )

6. 48 cm

7.  $144 \text{ cm}^2$

8.  $125 \text{ cm}^3$

9.  $240 \text{ cm}^3$

10.  $384 \text{ cm}^2$

11.  $50 \text{ cm}^2$

12. 36 cm

13.  $78.5 \text{ cm}^2$

14.  $197.82 \text{ cm}^3$

15.  $452.16 \text{ cm}^2$

16.  $112 \text{ cm}^2$

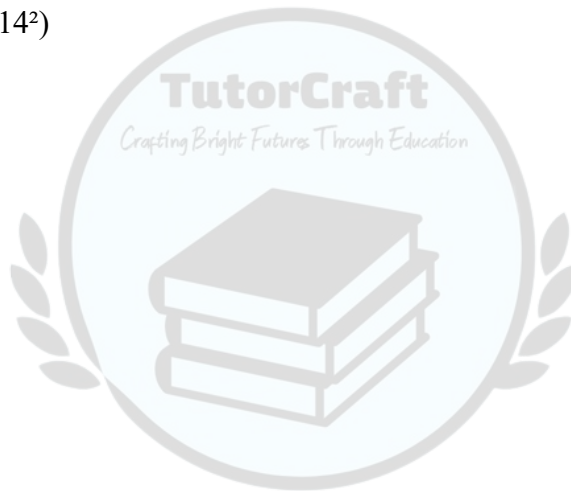
17. 36 cm

18.  $314 \text{ cm}^3$

19.  $40 \text{ cm}^2$

20. 54 cm

21.  $50 \text{ cm}^2$



22. 15 cm
23.  $351.68 \text{ cm}^2$
24.  $1434.69 \text{ cm}^3$  (approx.)
25.  $200.96 \text{ cm}^2$
26. 96 cm
27.  $240 \text{ cm}^3$
28.  $43.3 \text{ cm}^2$  (approx.)
29.  $1728 \text{ cm}^3$
30. 94.2 cm
31.  $153 \text{ cm}^2$
32. 40 cm
33.  $600 \text{ cm}^2$
34.  $1383.74 \text{ cm}^2$
35.  $461.58 \text{ cm}^3$
36.  $96 \text{ cm}^2$
37. 42 cm
38.  $360 \text{ cm}^3$
39.  $625 \text{ cm}^2$
40.  $1256 \text{ cm}^2$



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### Notes for self-marking

- Use  $\pi \approx 3.14$  as specified; small rounding differences ( $\pm 0.02$ ) are acceptable.
- Give full credit for exact forms where applicable (e.g.,  $54/11$ , or formulas shown).
- Units must match the quantity: cm,  $\text{cm}^2$ ,  $\text{cm}^3$ , or km, and \$ for money.