Year 8 Expressions and Equations – Mixed Practice

ANSWER KEY HappyKids.fit

Answers and worked solutions · 30 questions

A. Mixed practice (mixed order)

1. **x = 10**

Expand: 2x + 10 = x + 20
Subtract 1x: x + 10 = 20, so x = 10
Check by substituting x = 10

2. **$5y^3$**

Divide the numbers: 10 ÷ 2 = 5
Subtract the powers of y: 5 – 2 = 3

3. **x = 7**

Subtract 6x from both sides: x – 12 = –5
x = 7, so x = 7
Check by substituting x = 7

4. **–1**

Substitute, putting negative numbers in brackets
Indices first: a square of a negative is positive, a cube keeps the sign
= –1

5. **x = (y – 5)/3**

Undo the operations on x in reverse order, doing the same to both sides
x = (y – 5)/3

6. **4a(5a – 3)**

HCF of the terms is 4a
4a(5a – 3)

7. **$5y^3 + 15y$**

Multiply each term in the bracket by 5y
$5y^3 + 15y$

8. **an expression: it is a collection of terms with no equals sign**

An expression: it is a collection of terms with no equals sign

9. **$2n^3 + 12n$**

Multiply each term in the bracket by 2n
$2n^3 + 12n$

10. **a = (v – u)/t**

Undo the operations on a in reverse order, doing the same to both sides
a = (v – u)/t

11. **n/2 + 3**

Start with n and follow the steps in order

n/2 + 3

12. **x = 7**

Subtract 5x from both sides: 3x + 12 = 33

3x = 21, so x = 7

Check by substituting x = 7

13. **1**

Substitute, putting negative numbers in brackets

Indices first: a square of a negative is positive, a cube keeps the sign

= 1

14. **10 and 15 still have a common factor. The HCF of 20 and 30 is 10: 10(2x + 3).**

Error: 2 is a common factor, but not the highest

HCF = 10

10(2x + 3)

15. **2, 3, 4, 5, 6, 7**

≤ includes the end value; < does not

2, 3, 4, 5, 6, 7

16. **4(8a – 3)**

HCF of 32 and 12 is 4

4(8a – 3)

17. **$3m^3$**

Divide the numbers: 15 ÷ 5 = 3

Subtract the powers of m: 6 – 3 = 3

18. **No. An equation is true for particular values of the unknown; a formula connects variables that can take many values.**

Test some values

An equation is true for particular values of the unknown; a formula connects variables that can take many values.

Decide

19. **$-6n^3 - 6n^2$**

Multiply each term in the bracket by $-2n^2$

$-6n^3 - 6n^2$

20. **$36x^4$**

Multiply the numbers: 6 × 6 = 36

Add the powers of x: 2 + 2 = 4

21. No. Counter-example: a = 1, b = 2 gives $(1 + 2)^2 = 9$, but $1^2 + 2^2 = 5$.

Test some values

Counter-example: a = 1, b = 2 gives $(1 + 2)^2 = 9$, but $1^2 + 2^2 = 5$.

Decide

22. c = y − mx

Undo the operations on c in reverse order, doing the same to both sides

c = y − mx

23. x = 4

Subtract 2x from both sides: 6x + 6 = 30

6x = 24, so x = 4

Check by substituting x = 4

24. −5, −4, −3, −2, −1

≤ includes the end value; < does not

−5, −4, −3, −2, −1

25. Subtracting 3x from both sides gives 3x, not 9x: 3x + 5 = 20, so x = 5.

Error: 3x was added instead of subtracted

3x = 15

x = 5

26. 2x(4x + 5)

HCF of the terms is 2x

2x(4x + 5)

27. 2(w + w + 4) = 32; w = 6 cm

Perimeter: 2(w + w + 4) = 32

4w + 8 = 32

w = 6

28. n/4 − 9

Start with n and follow the steps in order

n/4 − 9

29. 54

Substitute, putting negative numbers in brackets

Indices first: a square of a negative is positive, a cube keeps the sign

= 54

30. an equation: it is true for one value of n only (n = 10)

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