Name:

Level 2 Further Maths

Factor Theorem

Corbettmaths

Ensure you have: Pencil or pen, a calculator

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Revision for this topic

www.corbettmaths.com/more/further-maths/

1. Use factor theorem to show that $(x-1)$ is a factor of $x^3-3x^2-13x+15$

(1)

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2. Use factor theorem to show that $(x-3)$ is a factor of x^3-10x^2+21x

(1)

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3. Use factor theorem to show that $(x+4)$ is a factor of $x^3+4x^2-3x-12$

(1)

4. Use factor theorem to show that $(2x - 1)$ is a factor of $2x^3 + 7x^2 + 2x - 3$

(2)

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5. $f(x) = 4x^3 + 5x^2 - 23x - 6$

Use the factor theorem to show that $(4x + 1)$ is a factor of $f(x)$

(2)

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6. Use the factor theorem to show that $(x + 5)$ is **not** a factor of $x^3 - 12x^2 + 47x - 35$

(2)

7. (a) Use the factor theorem to show that $(x-1)$ is a factor of $x^3 - x^2 - 4x + 4$

(1)

(b) Hence, factorise fully $x^3 - x^2 - 4x + 4$

.....

(3)

8. (a) Use the factor theorem to show that $(x - 2)$ is a factor of $x^3 - 9x^2 + 20x - 12$

(1)

(b) Hence, factorise fully $x^3 - 9x^2 + 20x - 12$

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(3)

9. (a) Use the factor theorem to show that $(x + 4)$ is a factor of $2x^3 + 5x^2 - 14x - 8$

(1)

(b) Hence, factorise fully $2x^3 + 5x^2 - 14x - 8$

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(4)

10. (a) Use the factor theorem to show that $(2x - 3)$ is a factor of $2x^3 + x^2 - 12x + 9$

(2)

(b) Hence, factorise fully $2x^3 + x^2 - 12x + 9$

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(3)

11. (a) Use the factor theorem to show that $(x-2)$ and $(x+5)$ are factors of $x^3+2x^2-13x+10$

(2)

(b) Use the factor theorem to show that $(x-2)$ and $(x+5)$ are also factors of $x^3+11x^2+14x-80$

(2)

(c) Hence, simplify fully $\dfrac{x^3+2x^2-13x+10}{x^3+11x^2+14x-80}$

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(3)

12. (a) Show that $(x + 3)$ is a factor of $x^3 + 3x^2 - 49x - 147$

(2)

(b) Hence, or otherwise, find all the solutions of $x^3 + 3x^2 - 49x - 147 = 0$

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(4)

13. Factorise fully $x^3 - 6x^2 + 11x - 6$

(5)

14. $(x - 5)$ is a factor of $x^3 - x^2 - 32x + a$

Work out the value of a

$a =$ .....

(2)

14. $(x + 4)$ is a factor of $x^3 + 11x^2 + ax - 72$

Work out the value of a

$a =$ .....

(3)

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15. Given $(x - 1)$ is a factor of $3x^3 - 15x^2 + ax + a$

Find the value of a

$a =$ .....

(4)

16. $(x + a)$ is a factor of $x^3 - 7x^2 + ax + 20a$

(a) Show that $a = 2$

(2)

(b) Solve $x^3 - 7x^2 + 2x + 40 = 0$

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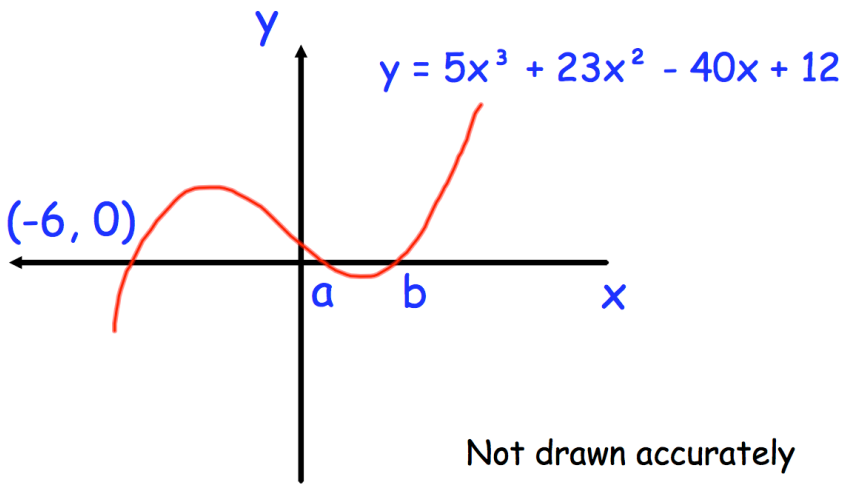
(4)

17. Below is the graph of $y = 5x^3 + 23x^2 - 40x + 12$



Find the coordinates of the points *a* and *b,* where the graph of $y = 5x^3 + 23x^2 - 40x + 12$ crosses the x-axis.

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(4)

18. Solve $x^3 - 19x^2 + 103x - 165 = 0$

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(5)