2.1 Algebraic Fractions: Simplifying, Multiplying and Dividing: Test Pack

AQA 8365 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Which of the following is the fully simplified form of $(15x^3y^2)/(20x^5y^4)$?

- ☐ A) $3/(4x^2y^2)$
- ☐ B) $3x^2y^2/4$
- ☐ C) $3/(4xy^2)$
- ☐ D) $15/(20x^2y^2)$

(Total for Question 1 is 1 mark)

---

2 Simplify fully $(35p^3q^5)/(20p^6q^2)$

(Total for Question 2 is 1 mark)

---

3 Simplify fully $(7x+21)/(x^2+3x)$

(Total for Question 3 is 1 mark)

---

4 Priya is asked to simplify $(x^2-16)/(x-4)$ and writes the answer as x-16.

(a) Explain the mistake Priya has made. **(1)**

(b) Work out the correct fully simplified answer. **(2)**

(Total for Question 4 is 3 marks)

© Revision Library | revisionlibrary.co.uk

5 Simplify fully $(x+4)/(x^2-9) \times (x-3)/(3x+12)$

(Total for Question 5 is 4 marks)

---

6 Simplify fully $(x^2-64)/(x^2+3x-40)$

(Total for Question 6 is 2 marks)

---

7 Show that $(2x^2+9x+4)/(x^2-16)$ simplifies to $(2x+1)/(x-4)$

(Total for Question 7 is 3 marks)

---

8 Simplify fully $(x^2 - 4x - 32) / (x + 4)$.

(Total for Question 8 is 3 marks)

---

9 Simplify fully $(6x^2 + 19x + 15) / (8x^2 + 2x - 15)$.

(Total for Question 9 is 3 marks)

© Revision Library | revisionlibrary.co.uk

10 Simplify fully $(x^2 + 4x - 12)/(x + 8) / ((x - 2)/(x^2 + 15x + 56))$.

(Total for Question 10 is 4 marks)

---

11 Simplify fully $(x^2 + 9x + 20)/(x - 5) / ((x + 5)/(x^2 + 2x - 35))$.

(Total for Question 11 is 4 marks)

---

12 Simplify fully $(x^2 - 100) / (x^2 + 18x + 80)$.

(Total for Question 12 is 3 marks)

---

13 Simplify fully $5(x^2 - 7x + 6) / (4x - 4)$.

(Total for Question 13 is 3 marks)

---

14 Simplify fully $(x^2-4)/(x+5) / (x-2)/(4x+20)$

(Total for Question 14 is 4 marks)

© Revision Library | revisionlibrary.co.uk

15 $(x^2-2x-15)/(x^2-25) \times (x^2+5x)/(x^2+8x+15)$

(a) Simplify the expression above fully. **(5)**

(b) Hence find the value of the expression when $x=10$, giving your answer as a fraction in its simplest form. **(2)**

.....

(Total for Question 15 is 7 marks)

---

16 A rectangular banner has area $(x^2-9)/(x+4)$ m^2 and length $(x-3)/(x^2-16)$ m. Find an expression for the width of the banner in its simplest form.

(Total for Question 16 is 4 marks)

© Revision Library | revisionlibrary.co.uk

Mark scheme · 2.1 Algebraic Fractions: Simplifying, Multiplying and Dividing: Test Pack

Question 1

correct option identified (A) oe **B1**

Answer: A) $3/(4x^2y^2)$

Question 2

$7q^3/(4p^3)$ cao **B1**

Answer: $7q^3/(4p^3)$

Question 3

7/x cao, factorising 7(x+3) and x(x+3) then cancelling (x+3) **B1**

Answer: 7/x

Question 4

(a) identifies that x^2-16 must first be factorised as (x-4)(x+4) as a difference of two squares before any cancelling, rather than cancelling the 16 and the 4 as separate terms oe **B1**

(a) Answer: Priya cancelled individual terms (16 and 4) instead of factorising the numerator first.

(b) factorises x^2-16 as (x-4)(x+4) **M1**

(b) x+4 cao **A1**

(b) Answer: x+4

Question 5

x^2-9 factorised as (x-3)(x+3) **M1**

3x+12 factorised as 3(x+4) **M1**

cancels (x+4) and (x-3) correctly **M1**

1/(3x+9) oe cao **A1**

Answer: 1/(3x+9)

Question 6

numerator factorised as (x-8)(x+8) and denominator as (x-5)(x+8) **M1**

(x-8)/(x-5) cao **A1**

Answer: (x-8)/(x-5)

Question 7

numerator factorised as (2x+1)(x+4) **M1**

denominator factorised as (x-4)(x+4) **M1**

cancels (x+4) correctly to reach (2x+1)/(x-4) cso **A1**

Answer: (2x+1)/(x-4)

Question 8

factorises the numerator as (x + 4)(x - 8) **M1**

cancels the common factor **M1**

x - 8 cao **A1**

Answer: x - 8

Question 9

factorises numerator: (2x + 3)(3x + 5) **M1**

factorises denominator: (2x + 3)(4x - 5) **M1**

(3x + 5)/(4x - 5) oe cao **A1**

Answer: (3x + 5)/(4x - 5)

Question 10

inverts the second fraction and multiplies **M1**

factorises both quadratics **M1**

cancels common factors **M1**

(x + 6)(x + 7) oe cao **A1**

Answer: (x + 6)(x + 7)

Question 11

inverts the second fraction and multiplies **M1**

factorises both quadratics **M1**

cancels common factors **M1**

(x + 4)(x + 7) oe cao **A1**

Answer: (x + 4)(x + 7)

Question 12

x^2 - 100 = (x + 10)(x - 10) **M1**

denominator = (x + 10)(x + 8) **M1**

(x - 10)/(x + 8) oe cao **A1**

Answer: (x - 10)/(x + 8)

Question 13

factorises x^2 - 7x + 6 = (x - 1)(x - 6) **M1**

factorises denominator = 4(x - 1) **M1**

5(x - 6)/4 oe cao **A1**

Answer: 5(x - 6)/4

Question 14

inverts second fraction and factorises x^2-4 as (x-2)(x+2) **M1**

4x+20 factorised as 4(x+5) **M1**

cancels (x-2) and (x+5) correctly **M1**

4x+8 oe cao **A1**

Answer: 4x+8

Question 15

(a) factorises x^2-2x-15 as (x-5)(x+3) and x^2-25 as (x-5)(x+5) **M1**

(a) factorises x^2+5x as x(x+5) and x^2+8x+15 as (x+3)(x+5) **M1**

(a) cancels (x-5) and (x+3) correctly **M1**

(a) cancels one remaining factor of (x+5) correctly **M1**

(a) x/(x+5) oe cao **A1**

(a) Answer: x/(x+5)

(b) substitutes x=10 into x/(x+5) ft from part (a) **M1**

(b) 2/3 oe cao **A1**

(b) Answer: 2/3

Question 16

sets up width = area / length **M1**

factorises x^2-9 as (x-3)(x+3) and x^2-16 as (x-4)(x+4) **M1**

inverts the length fraction and multiplies, cancelling (x-3) and (x+4) correctly **M1**

(x+3)(x-4) oe, or x^2-x-12, cao **A1**

Answer: (x+3)(x-4), which expands to x^2-x-12

© Revision Library | revisionlibrary.co.uk