MATHEMATICS

Topic: ALGEBRA, EQUATIONS, AND INEQUALITIES
GRADE 10

CAPS ALIGNED

SIMPLIFY EXPRESSIONS

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Simplify- GRADE 10
Exercises - A

DBE/NOVEMBER 2015

1.2 Simplify the following expressions fully:

1.2.1 $\frac{3}{a-4}+\frac{2}{a+3}-\frac{21}{a^2-a-12}$

1.2.2 $\frac{10^{2x+3}.4^{1-x}}{25^{2+x}}$

Solutions

1.2.1 $\frac{3}{(a-4)}+\frac{2}{(a+3)}-\frac{21}{(a^2-a-12)}$

$=\frac{3}{(a-4)}+\frac{2}{(a+3)}-\frac{21}{(a-4)(a+3)}$

$=\frac{3}{(a-4)}\times\frac{(a+3)}{(a+3)}+\frac{2}{(a+3)}\times\frac{(a-4)}{(a-4)}-\frac{21}{(a-4)(a+3)}$

$=\frac{3(a+3)+2(a-4)-21}{(a-4)(a+3)}$

$=\frac{3a+9+2a-8-21}{(a-4)(a+3)}$

$=\frac{5a-20}{(a-4)(a+3)}=\frac{5(a-4)}{(a-4)(a+3)}$

$=\frac{5}{(a+3)}$

Simplify- GRADE 10
Exercises - A

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1.2.2 $\frac{10^{2x+3}.4^{1-x}}{25^{2+x}}$

Solution

1.2.2 $\frac{10^{2x+3}\cdot 4^{1-x}}{25^{2+x}}$

$=\frac{(5\times 2)^{2x+3}\cdot(2^2)^{1-x}}{(5^2)^{2+x}}$

$=\frac{5^{2x+3}\cdot 2^{2x+3}\cdot 2^{2\cdot(1-x)}}{5^{2(2+x)}}$

$=\frac{5^{2x+3}\cdot 2^{2x+3}\cdot 2^{2-2x}}{5^{4+2x}}$

$=5^{2x+3-(4+2x)}\cdot 2^{2x+3+2-2x}$

$=5^{2x+3-4-2x}\cdot 2^{5}$

$=5^{-1}\cdot 32=\frac{32}{5}$

Simplify- GRADE 10
Exercises - B

DBE/NOVEMBER 2016

1.2 Simplify the following:

1.2.1 $\dfrac{2^{a+1}-2^{a-1}}{2^a}$

1.2.2 $\dfrac{x^2-x+1}{x^3+1} \div \dfrac{2x}{2x+2}$

Solution

$1.2.2 \quad \dfrac{(x^2-x+1)}{(x^3+1)} \div \dfrac{2x}{(2x+2)}$

$= \dfrac{(x^2-x+1)}{(x+1)(x^2-x+1)} \times \dfrac{(2x+2)}{2x}$

$= \dfrac{1}{(x+1)} \times \dfrac{2(x+1)}{2x}$

$= \dfrac{1}{x}$

Simplify- GRADE 10
Exercises - C

DBE/NOVEMBER 2017

1.3 Simplify the following completely:

1.3.1 $(2y+3)(7y^2-6y-8)$

1.3.2 $\frac{3}{x^2-9}+\frac{2}{(x-3)^2}$

1.3.3 $\frac{3^t-3^{t-2}}{2.3^t-3^t}$

Solution

1.3.1 $(2y+3)(7y^2-6y-8)$

$= 2y(7y^2-6y-8)+3(7y^2-6y-8)$

$= 14y^3-12y^2-16y+21y^2-18y-24$

$= 14y^3+9y^2-34y-24$

1.3.2 $\frac{3}{(x^2-9)}+\frac{2}{(x-3)^2}$

$= \frac{3}{(x-3)(x+3)}+\frac{2}{(x-3)^2}$

$= \frac{3}{(x-3)(x+3)}\times\frac{(x-3)}{(x-3)}+\frac{2}{(x-3)^2}\times\frac{(x+3)}{(x+3)}$

$= \frac{3(x-3)+2(x+3)}{(x-3)^2(x+3)}$

$= \frac{3x-9+2x+6}{(x^2-3)(x+3)}$

$= \frac{(5x-3)}{(x^2-3)(x+3)}$

Simplify- GRADE 10
Exercises - C

DBE/NOVEMBER 2017

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1.3.1 $(2y+3)(7y^2-6y-8)$

1.3.2 $\frac{3}{x^2-9}+\frac{2}{(x-3)^2}$

1.3.3 $\frac{3^t-3^{t-2}}{2.3^t-3^t}$

Solution

1.3.3 $\frac{3^t-3^{t-2}}{2.3^t-3^t}$

$= \frac{3^t-3^t.3^{-2}}{2.3^t-3^t}$

$= \frac{3^t(1-3^{-2})}{3^t(2-1)}$

$= \frac{1-\frac{1}{3^2}}{1}$

$= 1-\frac{1}{9} = \frac{9}{9}-\frac{1}{9} = \frac{9-1}{9} = \frac{8}{9}$

ALGEBRA, EQUATIONS, AND INEQUALITIES - GRADE 10

Exercises - D

DBE/NOVEMBER 2018

1.2 Simplify the following expressions fully:

1.2.1 $(x+2)(x^2-x+3)$

1.2.2 $\frac{5}{x+3}-\frac{3}{2-x}$

1.2.3 $\frac{25^{-x}.15^{x+1}}{3^x.5^{-x}}$

Solution

1.2.1 $(x+2)(x^2-x+3)$

$= x(x^2-x+3)+2(x^2-x+3)$

$= x^3-x^2+3x+2x^2-2x+6$

$= x^3+x^2+x+6$

1.2.2 $\frac{5}{(x+3)}-\frac{3}{(2-x)}$

$= \frac{5}{(x+3)}-\frac{3}{(x-2)}$

$= \frac{5}{(x+3)}+\frac{3}{(x-2)}$

$= \frac{5}{(x+3)}\times\frac{(x-2)}{(x-2)}+\frac{3}{(x-2)}\times\frac{(x+3)}{(x+3)}$

$= \frac{5x-10+3x+9}{(x+3)(x-2)}$

$= \frac{(8x-1)}{(3x+3)(x-2)}$

ALGEBRA, EQUATIONS, AND INEQUALITIES - GRADE 10

Exercises - D

DBE/NOVEMBER 2018

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1.2.1 $(x+2)(x^2-x+3)$

1.2.2 $\frac{5}{x+3}-\frac{3}{2-x}$

1.2.3 $\frac{25^{-x}.15^{x+1}}{3^x.5^{-x}}$

Solution

1.2.3 $\frac{25^{-x}.15^{x+1}}{3^x.5^{-x}}$

$= \frac{(5^2)^{-x}.(5\times 3)^{x+1}}{3^x.5^{-x}}$

$= \frac{5^{-2x}.5^{x+1}.3^{x+1}}{3^x.5^{-x}}$

$= 5^{-2x+x+1+x}.3^{x+1-x}$

$= 5^1.3^1$

$= 15$

END

$$e^{i\pi}+1=0$$

Euler's Identity

SOURCES

1. *FET CAPS DOCUMENT*
2. *GRADE 10 EXAMINATION GUIDELINES*
3. *GRADE 10 DBE/NOVEMBER 2015 -2018*