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FUNDAMENTAL OPERATIONS

SUBJECT : MATHEMATICS
CHAPTER NUMBER:19
CHAPTER NAME :FUNDAMENTAL OPERATIONS
SUBTOPIC : More Problems on the above concepts.
PERIOD NO: 6

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Learning outcomes

- Students will be able to divide polynomial by polynomial.
- Students will develop application skill.

PREVIOUS KNOWLEDGE TEST

1. Divide

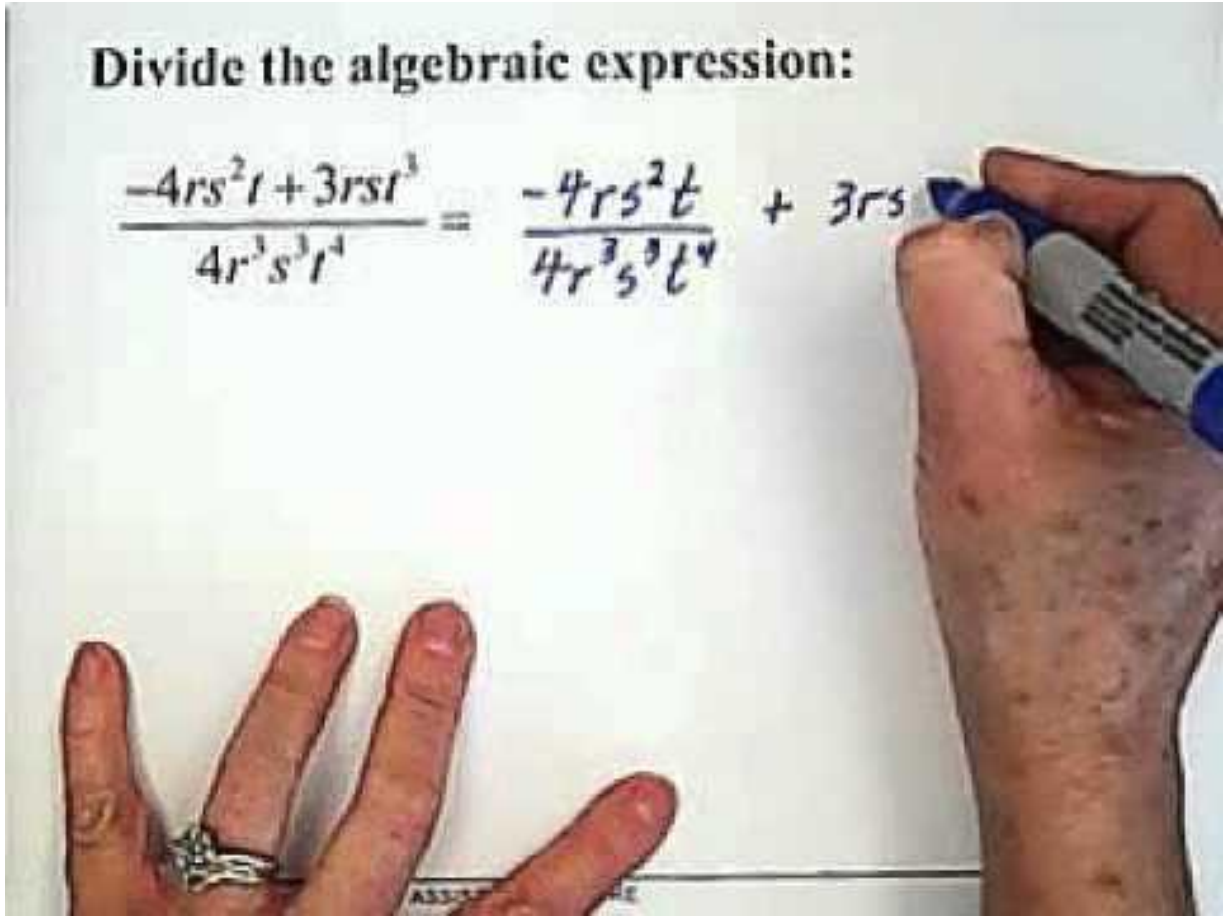
(i) $-21m^5n^7$ by $14m^2n^2$

(ii) $36a^4x^5y^6$ by $4x^2a^3y^2$

(iii) $20x^3a^6$ by $5xy$

$\frac{x}{x} = 1$ $\frac{2x}{x}$ $\frac{x}{2x}$ $\frac{2x}{2x}$

$\frac{3}{3} = 1$ $\frac{100}{100} = 1$ $\frac{1000000}{1000000}$



Evaluation Question EX-19 D

4. Simplify:

(i) $(- 15m^5n^2) / (- 3m^5)$

(ii) $35x^4y^2 / – 15x^2y^2$

(iii) $(- 24x^6y^2) / (6x^6y)$

Solution:

(i) $(-15m^5n^2) / (- 3m^5) = (-15 \times m^5 \times n^2) / (- 3 \times m^5)$

This can be written as,

$= (3 \times 5 \times m^{5-5} \times n^2) / 3$

$= 5 \times m^0 \times n^2 = 5 \times 1 \times n^2$

$= 5n^2$

Hence, $(-15m^5n^2) / (- 3m^5) = 5n^2$

Evaluation Question EX-19 D

Solution: (ii) $35x^4y^2 / -15x^2y^2$

$35x^4y^2 / -15x^2y^2 = (35 \times x^4 \times y^2) / (-15 \times x^2 \times y^2)$

This can be written as,

$= -(5 \times 7 \times x^{4-2} \times y^{2-2}) / (3 \times 5) = -(7 \times x^2 \times y^0) / 3$

$= -7x^2y / 3$

Hence, $35x^4y^2 / -15x^2y^2 = -7x^2y / 3$

(iii) $(-24x^6y^2) / (6x^6y)$

$(-24x^6y^2) / (6x^6y) = (-24 \times x^6 \times y^2) / (6 \times x^6 \times y)$

This can be written as, $(-4 \times 6 \times x^{6-6} \times y^{2-1}) / 6$

$= -4 \times x^0 \times y^1 = -4y$

Hence, $(-24x^6y^2) / (6x^6y) = -4y$

Evaluation Question EX-19 D

5. Divide:

(i) $9x^3 – 6x^2$ by $3x$

(ii) $6m^2 – 16m^3 + 10m^4$ by $– 2m$

(iii) $15x^3y^2 + 25x^2y^3 – 36x^4y^4$ by $5x^2y^2$

(iv) $36a^3x^5 – 24a^4x^4 + 18a^5x^3$ by $– 6a^3x^3$

Solution: (i) $9x^3 – 6x^2$ by $3x$

$9x^3 – 6x^2 \div 3x = (9 \times x^3 – 6 \times x^2) / (3 \times x)$

Separating the terms, we get

$= (9 \times x^3) / (3 \times x) – (6 \times x^2) / (3 \times x) = 3 \times x^{3-1} – 2 \times x^{2-1}$

$= 3x^2 – 2x$

Hence, $9x^3 – 6x^2 \div 3x = 3x^2 – 2x$

Evaluation Question EX-19 D

Solution: (ii) $6m^2 – 16m^3 + 10m^4$ by $– 2m$

$6m^2 – 16m^3 + 10m^4 \div – 2m = (6 \times m^2 – 16 \times m^3 + 10 \times m^4) / – 2 \times m$

Separating the terms, we get

$= (6 \times m^2 / – 2 \times m) – (16 \times m^3) / (- 2 \times m) + (10 \times m^4) / (- 2 \times m)$

$= – 3 \times m^{2-1} + 8 \times m^{3-1} – 5 \times m^{4-1}$

$= – 3 \times m + 8 \times m^2 – 5 \times m^3$

$= – 3m + 8m^2 – 5m^3$

Hence, $6m^2 – 16m^3 + 10m^4 \div – 2m = – 3m + 8m^2 – 5m^3$

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Evaluation Question EX-19 D

Solution: (iii) $15x^3y^2 + 25x^2y^3 – 36x^4y^4$ by $5x^2y^2$

$15x^3y^2 + 25x^2y^3 – 36x^4y^4 \div 5x^2y^2$

$= (15x^3y^2 + 25x^2y^3 – 36x^4y^4) / (5x^2y^2)$

$= (15 \times x^3 \times y^2) / (5 \times x^2 \times y^2) + (25 \times x^2 \times y^3) / (5 \times x^2 \times y^2) – (36 \times x^4 \times y^4) / (5 \times x^2 \times y^2)$

On further calculation, we get

$= 3 \times x^{3-2} \times y^{2-2} + 5 \times x^{2-2} \times y^{3-2} – (36 \times x^{4-2} \times y^{4-2}) / 5$

We get,

$= 3 \times x^1 \times y^0 + 5 \times x^0 \times y^1 – (36 \times x^2 \times y^2) / 5$

$= 3x + 5y – (36x^2y^2) / 5$

Hence, $15x^3y^2 + 25x^2y^3 – 36x^4y^4 \div 5x^2y^2 = 3x + 5y – (36x^2y^2) / 5$

Evaluation Question EX-19 D

Solution: (iv) $36a^3x^5 - 24a^4x^4 + 18a^5x^3$ by $-6a^3x^3$

$36a^3x^5 - 24a^4x^4 + 18a^5x^3 \div (-6a^3x^3) = (36a^3x^5 - 24a^4x^4 + 18a^5x^3) / -6a^3x^3$

$= (36.a^3.x^5) / (-6.a^3.x^3) - (24.a^4.x^4) / (-6.a^3.x^3) + (18.a^5.x^3) / (-6.a^3.x^3)$

We get,

$= -6.x^{5-3} + 4.a^{4-3}.x^{4-3} - 3.a^{5-3}$

$= -6x^2 + 4ax - 3a^2$

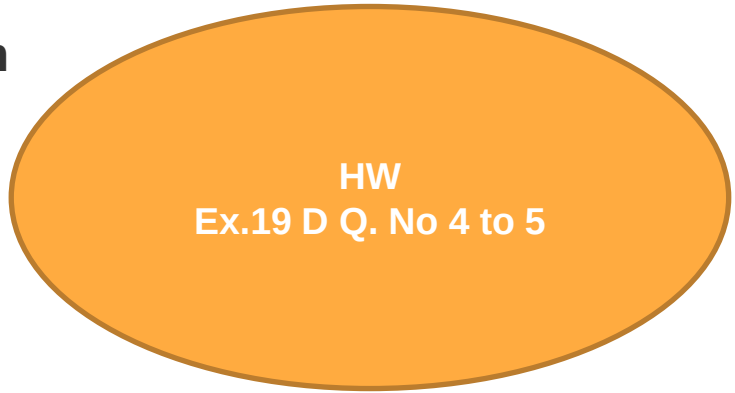
Hence, $36a^3x^5 - 24a^4x^4 + 18a^5x^3 \div (-6a^3x^3) = -6x^2 + 4ax - 3a^2$

Additional Homework

1. Divide:

(i) $n^2 - 2n + 1$ by $n - 1$

(ii) $m^2 - 2mn + n^2$ by $m - n$



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