

Divide Polynomials by Monomials

8.A.9 Divide a polynomial by a monomial (integer coefficients) *Note: The degree of the denominator is less than or equal to the degree of the numerator for all variables.*

To divide a polynomial by a monomial, divide each term of the polynomial by the monomial.

Find $(3r^2 - 15r) \div 3r$.

$$(3r^2 - 15r) \div 3r = \frac{3r^2 - 15r}{3r}$$

Write as a rational expression.

$$= \frac{3r^2}{3r} - \frac{15r}{3r}$$

Divide each term by $3r$.

$$= \frac{r}{1} - \frac{5}{1}$$

Simplify each term.

$$= r - 5$$

Simplify.

EXERCISES

Find each quotient.

1. $(3x^2 + 9x - 42x^3) \div 3x$

2. $(14a^2 + 7a - 28a^3) \div 7a$

3. $\frac{9s^3t^2 - 15s^2t^3 + 24t^2s^4}{3s^2t^2}$

4. $\frac{12a^3b + 16ab^3 - 8ab}{4ab}$

5. $15q^3 - 20q^2 + 10q \div 5q$

6. $(12c^5d^6 + 36c^4d^4 - 42c^2d^5) \div 6c^2d^3$

7. $\frac{33e^3f^5 - 11e^2f^2 + 22ef^5}{11ef^2}$

8. $\frac{64x^4y^4 + 16x^3y^3 - 32x^2y^2 + 8xy}{8xy}$

9. $(12c^3d^5 - 24c^2d^6 + 48c^2d^7) \div 12c^2d$

10. $(72b^2c - 54b^2c^2 + 63b^3c - 18b^4) \div 9b$

11. $(39z^7 + 26z^6 - 52z^5) \div 13z^5$

12. $(70r^3s^3 + 20r^4s^2 + 30r^7s^4 - 50r^8s^5) \div 10r^2s^2$

13. $\frac{70m^5n^3 - 56m^3n + 84m}{14m}$

14. $\frac{85k^4 - 51k^3n + 119k^2n^2}{17k}$

15. $(76p^6q^7 - 19p^5q^6 + 38p^3q^5 + 57p^2q^4) \div 19p^2q^3$

16. $\frac{14m^3no^2p^5 - 38m^2n^4op^8 + 6mn^7o^9p^{12}}{2mnop}$