

Divide using long division. Write your answer in fraction form.

1) $(16x^4 - 4x^3 - 10x^2 - 13x + 10) \div (4x - 3)$

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

2) $(8x^2 - 17x - 24) \div (x - 3)$

$$8x + 7 - \frac{3}{x-3}$$

3) $(9x^3 + 28x^2 + 19x - 13) \div (x + 2)$

$$9x^2 + 10x - 1 - \frac{11}{x+2}$$

4) $(5x^4 + 15x^3 + x^2 + 19x + 28) \div (x^2 + 4x + 3)$

$$5x^2 - 5x + 6 + \frac{10x+10}{x^2+4x+3}$$

5) $(18x^5 + 9x^4 - 15x^3 - 12x^2 - x - 2) \div (6x^2 - 3x - 2)$

$$3x^3 + 3x^2 - 1 + \frac{-4x-4}{6x^2-3x-2}$$

6) $(30x^4 - 4x^3 + 19x^2 - 15x - 10) \div (5x^2 + x + 6)$

$$6x^2 - 2x - 3 + \frac{8}{5x^2+x+6}$$

Divide using synthetic division. Write your answer in fraction form.

7) $(5x^5 + 15x^4 - 7x^3 - 23x^2 - 8x + 5) \div (x + 3)$

$$5x^4 - 7x^2 - 2x - 2 + \frac{11}{x+3}$$

8) $(x^2 - x - 20) \div (x - 6)$

$$x + 5 + \frac{10}{x-6}$$

9) $(2x^4 - 21x^2 + 22) \div (x - 3)$

$$2x^3 + 6x^2 - 3x - 9 - \frac{5}{x-3}$$

10) $(6x^3 - 14x^2 - 4) \div (x - 2)$

$$6x^2 - 2x - 4 - \frac{12}{x-2}$$

$$11) (18x^3 - 29x^2 + 15x - 12) \div (2x - 3)$$

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

$$12) (8x^2 + 4x - 25) \div (4x - 6)$$

$$2x + 4 - \frac{1}{4x-6}$$

Determine if $d(x)$ is a factor of $f(x)$.

$$13) f(x) = 30x^3 + 3x^2 + 3x - 6$$

$$d(x) = 6x - 3$$

yes

$$14) f(x) = 24x^3 - 30x^2 - 8x + 10$$

$$d(x) = 4x - 5$$

yes

$$15) f(x) = 16x^4 + 16x^3 + 28x^2 + 24x - 6$$

$$d(x) = 4x + 2$$

no

$$16) f(x) = 10x^4 + 21x^3 + 16x^2 - 2x - 6$$

$$d(x) = 2x + 1$$

no

$$17) f(x) = 2x^5 + 2x^4 - 14x^3 + 6x^2 - 5x + 2$$

$$d(x) = x - 2$$

yes

$$18) f(x) = 9x^2 - 17x - 30$$

$$d(x) = x - 3$$

yes

$$19) f(x) = 2x^2 - 9x - 12$$

$$d(x) = x - 6$$

no

$$20) f(x) = 5x^5 + 10x^4 + 8x^3 + 8x^2 - 2x - 15$$

$$d(x) = x + 1$$

no