

### 3.3: Dividing Polynomials

1. If  $\frac{8x^4+6x^2-3x+1}{2x^2-x+2} = Q(x) + \frac{ax+b}{2x^2-x+2}$ , then  $a + b =$

A) -6

B) 7

C) -8

D) 5

E) 3

2. Performing the division  $\frac{2x^4-3x^2-3x+1}{x^2+x-1}$ , the quotient  $Q(x)$  and remainder  $R(x)$  are:

A)  $Q(x) = 2x^2 - 2x + 1; R(x) = -6x + 2$

B)  $Q(x) = 2x^2 + 2x + 1; R(x) = 6x + 2$

C)  $Q(x) = 2x^2 + 2x - 1; R(x) = 6x - 2$

D)  $Q(x) = 2x^2 - 2x - 1; R(x) = -6x - 2$

E)  $Q(x) = 2x^2 - 2x; R(x) = -6x$

3. If  $-x^3 + kx^2 - 5x - 20$  is divided by  $x + 2$ , then the set of all values of  $k$  which makes the remainder positive is

A)  $(1/2, \infty)$

B)  $(11/2, \infty)$

C)  $(9/2, \infty)$

D)  $(19/2, \infty)$

E)  $\emptyset$

4. If  $f(x) = 5x^4 - 12x^2 + 2x + k$  is divided by  $x - 2$ , the remainder is 28, then  $k =$

A) -8

B) -36

C) -16

D) 8

E) 16

5. If  $x + \frac{1}{2}$  is a factor of the polynomial  $p(x) = 10x^4 + 9x^3 - 4x^2 + (k + 3)x + k$ , then  $k =$

A) 6

B) -5

C) 12

D)  $-3/2$

E)  $5/2$

6. If  $x^{55} - 8x + 1$  is divided by  $x + 1$ , then the remainder is

A) 6

B) 10

C) -6

D) 8

E) -8

7. Upon dividing  $x^4 + 3x^3 + x^2 - 3x + 15$  by  $x + 3$ , we get

A) quotient =  $x^3 + x - 6$ ; remainder = 177

B) quotient =  $x^3 - 6x - 6$ ; remainder = 33

C) quotient =  $x^3 + x - 6$ ; remainder = 33

D) quotient =  $x^3 - x - 6$ ; remainder =  $\frac{33}{x+3}$

E) quotient =  $x^3 + x^2 - 6$ ; remainder = 33

8. The values of  $k$  so that when  $x^2 - 3x - 8$  is divided by  $x + k$ , the remainder =  $-4$  is

A) 1,  $-4$

9. The value of  $k$  for which  $-3$  is a zero of the function  $f(x) = -x^4 + 3x^2 - 4x + k$  is

- A) 0
- B) -15
- C) 42
- D) 39
- E) -35

10. If  $3$  is a zero of  $f(x) = x^3 - x^2 - 4x - 6$ , then the other zeros are

- A)  $1 \pm i$
- B)  $1 \pm 2i$
- C)  $-1 \pm 2i$
- D)  $2 \pm i$
- E)  $-1 \pm i$

11. If  $x - 2$  is a factor of the polynomial  $x^3 - 5x^2 + 7x + k$ , then  $k$  is equal to

A) 14

B) -2

C) 2

D) -42

E) 42

12. The value of  $k$  so that  $p(x) = x^4 + kx^3 - 3kx + 9$  is divisible by  $x - 3$  is

A) 4

B) -5

C) 5

D) -4

E) 0

13. If  $x + 2$  is a factor of the polynomial  $p(x) = x^3 - kx^2 + 3x + 7k$ ,  
then  $k$  is equal to:

A)  $\frac{14}{3}$

B)  $\frac{11}{3}$

C)  $\frac{16}{3}$

D)  $\frac{10}{3}$

E)  $\frac{13}{3}$