

Chapter 2 Study Guide

Date _____ Period _____

Divide.

1) $(27 + k^3 + 32k + 10k^2) \div (4 + k)$

A) $k^2 + 6k + 6 - \frac{6}{4 + k}$

B) $k^2 + 6k + 8 - \frac{5}{4 + k}$

C) $k^2 + 6k + 5 - \frac{4}{4 + k}$

D) $k^2 + 6k + 6 - \frac{9}{4 + k}$

2) $(3k^2 - 38 + 10k^3 + 43k) \div (-7 + 10k)$

A) $k^2 + k + 5 - \frac{2}{-7 + 10k}$

B) $k^2 - k + 8 - \frac{8}{-7 + 10k}$

C) $k^2 + k + 4 - \frac{4}{-7 + 10k}$

D) $k^2 + k + 5 - \frac{3}{-7 + 10k}$

3) $(-7x^2 + 5x^3) \div (-7 + 5x)$

A) $x^2 - \frac{4}{-7 + 5x}$

B) $x^2 + \frac{4}{-7 + 5x}$

C) x^2

D) $x^2 + 2 - \frac{4}{-7 + 5x}$

Find all roots.

4) $x^3 + 5x^2 + 6x = 0$

A) $\{0, -2, -3\}$

B) $\{0, -3, -4\}$

C) $\{0, -1, -3\}$

D) $\{0, -2, -4\}$

5) $x^3 + 5x^2 + 4x + 20 = 0$

A) $\{-4, i\sqrt{5}, -i\sqrt{5}\}$

B) $\{-\frac{5}{3}, 2i, -2i\}$

C) $\{-5, 2i, -2i\}$

D) $\{-\frac{5}{2}, 2i, -2i\}$

6) $x^4 + 4x^2 - 12 = 0$

A) $\{0 \text{ mult. } 2, i\sqrt{6}, -i\sqrt{6}\}$

B) $\{i\sqrt{6}, -i\sqrt{6}, i\sqrt{3}, -i\sqrt{3}\}$

C) $\{i\sqrt{6}, -i\sqrt{6}, i, -i\}$

D) $\{i\sqrt{6}, -i\sqrt{6}, \sqrt{2}, -\sqrt{2}\}$

Simplify. Your answer should contain only positive exponents.

7) $2x^{-3}y^4 \cdot 4x^3y^{-3} \cdot 2x^4y^{-2}$

- A) $\frac{3x^8}{y^2}$ B) $\frac{16x^4}{y}$
 C) x^5y^6 D) $16x^2y^7$

8) $(2x^{-2}y^3)^{-4}$

- A) $\frac{x^8}{16y^{12}}$ B) $\frac{1}{64x^3y^9}$
 C) $\frac{64x^6}{y^3}$ D) $\frac{81y^4}{x^{16}}$

9) $\frac{3y^{-1}}{xy^2}$

- A) $\frac{3}{y^3x}$ B) $2x^4y^2$
 C) $\frac{4}{3x^2y^2}$ D) $\frac{y^4}{x^6}$

10) $\frac{2m^{-1}p^4}{q^4}$

- A) $\frac{2q^2}{3m^4p}$ B) $\frac{m^2p^2q^4}{2}$
 C) $\frac{2m}{p^4q^2}$ D) $\frac{2p^4}{mq^4}$

11) $\frac{(2a^{-3}b^{-1})^2}{2a^2b^{-3}}$

- A) $\frac{a^{12}b^9}{8c^{12}}$ B) $\frac{a^3}{c^3b^8}$
 C) $\frac{2b}{a^8}$ D) $a^9b^3c^{12}$

12) $2x^{-3}y^2 \cdot 3x^{-3}y^2z^3$

- A) $\frac{6x^7y^7}{z^3}$ B) $\frac{6y^4z^3}{x^6}$
 C) $\frac{6x^4y}{z}$ D) $\frac{6z^4y^4}{x^3}$

Factor each completely.

13) $49p^3 + 35p^2 + 28p + 20$

- A) $(7p^2 + 4)(7p + 5)$
 B) $(7p^2 - 4)(7p + 4)$
 C) $(7p^2 - 4)(7p - 4)$
 D) $(7p + 4)(7p^2 - 5)$

Factor each.

14) $x^6 + x^4 - 9x^2 - 9 = 0$

- A) $(x^2 + 3)^2(x^2 - 3) = 0$
 B) $(x^2 + 1)(x^2 - 3)(x^2 + 3) = 0$
 C) $(2x^2 + 1)(x^2 + 2)(x^2 + 3) = 0$
 D) $x^2(x^2 - 3)(x^2 + 3) = 0$

15) $x^4 + 6x^2 - 27 = 0$

- A) $(x^2 + 9)(x^2 - 3) = 0$
 B) $(x^2 + 9)(2x^2 - 3) = 0$
 C) $3(x^2 + 3)(x^2 - 3) = 0$
 D) $(x^2 + 9)(x^2 + 5) = 0$

Factor each completely.

16) $n^3 + 3n^2 - 40n$

- A) Not factorable
- B) $n(n - 5)(n + 8)$
- C) $4n(n + 9)(n - 2)$
- D) $(n + 5)(n + 8)$

Find all roots.

17) $(2x - 3)(2x^2 + 9)(x^2 + 7) = 0$

- A) $\left\{-2, \frac{3i\sqrt{2}}{2}, -\frac{3i\sqrt{2}}{2}, i\sqrt{7}, -i\sqrt{7}\right\}$
- B) $\left\{\frac{3}{2}, \frac{i\sqrt{22}}{2}, -\frac{i\sqrt{22}}{2}, i\sqrt{7}, -i\sqrt{7}\right\}$
- C) $\left\{\frac{3}{2}, \frac{i\sqrt{14}}{2}, -\frac{i\sqrt{14}}{2}, i\sqrt{7}, -i\sqrt{7}\right\}$
- D) $\left\{\frac{3}{2}, \frac{3i\sqrt{2}}{2}, -\frac{3i\sqrt{2}}{2}, i\sqrt{7}, -i\sqrt{7}\right\}$

18) $(3x^2 - 4)(3x^2 + 4)(x - 2)(x + 2)(x^2 + 4) = 0$

- A) $\left\{0, i\sqrt{2}, -i\sqrt{2}, \frac{2i\sqrt{3}}{3}, -\frac{2i\sqrt{3}}{3}, 2, 2i, -2i\right\}$
- B) $\left\{\frac{2\sqrt{3}}{3}, -\frac{2\sqrt{3}}{3}, \frac{i\sqrt{6}}{3}, -\frac{i\sqrt{6}}{3}, 2, -2, 2i, -2i\right\}$
- C) $\left\{\frac{2\sqrt{3}}{3}, -\frac{2\sqrt{3}}{3}, \frac{2i\sqrt{3}}{3}, -\frac{2i\sqrt{3}}{3}, 2, -2, 2i, -2i\right\}$
- D) $\left\{\frac{2\sqrt{3}}{3}, -\frac{2\sqrt{3}}{3}, \frac{2i\sqrt{3}}{3}, -\frac{2i\sqrt{3}}{3}, 2, -2, i\sqrt{5}, -i\sqrt{5}\right\}$

State the number of complex zeros for each function.

19) $f(x) = x^4 - 3x^2 - 10$

- A) 3
- B) 4
- C) 2
- D) 6

20) $f(x) = x^5 + 3x^4 + 12x^3 + 36x^2 + 27x + 81$

- A) 4
- B) 5
- C) 3
- D) 6

Answers to Chapter 2 Study Guide (ID: 1)

1) B
5) C
9) A
13) A
17) D

2) D
6) D
10) D
14) B
18) C

3) C
7) B
11) C
15) A
19) B

4) A
8) A
12) B
16) B
20) B