

Chapter 1

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- ____ 1. Rewrite the number without using the absolute value symbol, and simplify the result.

$$(4)|10 - 11|$$

- a. 29
- b. -84
- c. 4
- d. -4
- e. 84

- ____ 2. Rewrite the following expression without using the absolute value symbol, and simplify the result.

$$|2 - x| \text{ if } x < 2$$

- a. x
- b. $-2 - x$
- c. $2 - x$
- d. $-2 + x$
- e. $2 + x$

- ____ 3. Replace the symbol "?" to make the resulting statement true for all real numbers : p , b , and c , whenever the expressions are defined.

$$\frac{pb + pc}{p} ? b + pc$$

- a. =
- b. $\neq$

- ____ 4. Approximate the real-number expression to four decimal places :

$$\sqrt{(4.35 - 5.97)^2 + (2.26 - 4.39)^2}$$

- a. 3.7500
- b. 4.4261
- c. 1.9261
- d. 2.6761
- e. 5.5572

- ____ 5. Express the number in decimal form.

$$1.1 \times 10^{-2}$$

- a. 0.000011
- b. 0.011
- c. 0.0011

- d. 0.11
- e. 0.00011

6. The population dynamics of many fish are characterized by extremely high fertility rates among adults and very low survival rates among the young. A mature halibut may lay as many as 2.2 million eggs, but only 0.00036% of the offspring survive to the age of 3 years. Use scientific form to approximate the number of offspring that live to age 3.

- a. 6.11×10^6 offspring
- b. 7.92×10^6 offspring
- c. 8 offspring
- d. 7.92×10^2 offspring
- e. 6.11×10^3 offspring

7. The two given numbers are coordinates of points A and B , respectively, on a coordinate line. Express the indicated statement as an inequality involving the absolute value symbol.

x , -4 ; $d(A, B)$ is at least 7

- a. $|-4 - x| \geq 7$
- b. $|-4 - x| \leq 7$
- c. $|-4 - x| < 7$
- d. $|-4 + x| > 7$
- e. $|-4 + x| \geq 7$

8. Simplify the expression:

$$\left(\frac{-243x^5}{y^{-10}} \right)^{\frac{2}{5}}$$

- a. $-3x^2y^4$
- b. $9x^2y^4$
- c. $3x^2y^4$
- d. $-9x^2y^4$
- e. $-9x^4y^2$

9. Simplify the expression.

$$\frac{(x^4y^2)^{-\frac{1}{2}}}{(x^{16}y^8)^{-\frac{1}{8}}}$$

- a. 1
- b. $\sqrt{\frac{x}{y}}$

c. $\frac{x}{y}$

d. $\frac{x^2}{y^2}$

e. $\frac{y}{x}$

____ 10. Express as a polynomial.

$$(3x - 7)(x^2 - 5)(x^3 - 3)$$

- a. $3x^6 - 7x^5 - 15x^4 + 21x^3 - 26x^2 + 45x - 105$
- b. $3x^6 - 7x^5 - 15x^4 + 44x^3 + 21x^2 + 45x - 105$
- c. $3x^6 - 7x^5 - 15x^4 + 26x^3 + 21x^2 + 45x - 105$
- d. $3x^4 - 7x^3 - 15x^5 + 44x^6 + 21x^2 + 45x - 105$
- e. $3x^4 - 7x^5 - 15x^3 + 3x^6 + 7x^2 + 45x - 105$

____ 11. Express as a polynomial.

$$(9x^2 + 11y^2)^2$$

- a. $81x^4 + 198x^2y^2 + 121y^4$
- b. $121x^4 - 198x^2y^2 + 81y^4$
- c. $121x^4 + 99x^2y^2 + 81y^4$
- d. $81x^2 + 198x^4y^4 + 121y^2$
- e. $81x^4 + 99x^2y^2 + 121y^4$

____ 12. Express as a polynomial.

$$(2x + 7y)^3$$

- a. $8x^3 + 28x^2y + 294xy^2 + 196y^3$
- b. $8x^3 + 84x^2y + 294xy^2 + 343y^3$
- c. $8x^3 + 28x^2y + 98xy^2 + 343y^3$
- d. $8x^3 + 84x^2y + 98xy^2 + 686y^3$
- e. $8x^3 + 294x^2y + 84xy^2 + 343y^3$

____ 13. Factor the polynomial.

$$km + 4mt$$

- a. $m(k + t)$
- b. $m(4k + t)$
- c. $4(k + mt)$
- d. $m(k + 4t)$
- e. $4m(k + t)$

____ 14. Factor the polynomial.

$$14x^5y^4 + 7^2y^5$$

- a. $7x^2y^4(2x^3 + y)$

- b. $7x^2y^4(x^3 + y^5)$
- c. $14x^2y^4(2x^3 + y^2)$
- d. $7x^2y^4(x^3 + y)$
- e. $2x^2y^4(7x^3 + y)$

_____ 15. Factor the polynomial.

$$x^2 + 9x + 18$$

- a. $(x - 3)(x - 6)$
- b. $(x - 7)(x - 11)$
- c. $(x + 3)(x + 6)$
- d. $(x + 7)(x + 11)$
- e. $(x + 3)(x - 6)$

_____ 16. Factor the polynomial :

$$16x^2 - 56x + 49$$

- a. $(4x - 7)^2$
- b. $(6x + 7)^2$
- c. $(7x - 4)^2$
- d. $(4x - 7)(4x + 7)$

_____ 17. Factor the polynomial.

$$64x^{12} + 27y^3$$

- a. $(4x^8 + 3y)(16x^4 - 12x^4y + 9y^2)$
- b. $(4x^4 + 3y)(16x^8 - 24x^4y + 9y^2)$
- c. $(4x^4 + 3y)(16x^8 - 12x^4y + 9y^2)$
- d. $(4x^4 - 3y)(16x^8 + 12x^4y + 9y^2)$
- e. $(4x^4 + 3y)(16x^8 + 24x^4y - 9y^2)$

_____ 18. Factor the polynomial.

$$x^2 + 2x + 1 - 36y^2$$

- a. $(x - 1 + 6y)(x - 1 + 6y)$
- b. $(x + 1 + 6y)(x + 1 - 6y)$
- c. $(x + 1 + 6y)(x - 1 - 6y)$
- d. $(x - 1 + 6y)(x + 1 - 6y)$
- e. $(x + 1 - 6y)(x + 1 - 6y)$

_____ 19. Write the expression as a simplified rational number.

$$\frac{6}{50} + \frac{1}{80}$$

- a. $\frac{89}{440}$
- b. $\frac{53}{410}$

c. $\frac{89}{400}$

d. $\frac{53}{440}$

e. $\frac{53}{400}$

_____ 20. Simplify the expression.

$$\frac{2x^2 + 19x + 9}{2x^2 - 15x - 8}$$

a. $\frac{x+9}{1-x}$

b. $\frac{9x-1}{x+8}$

c. $\frac{8x+1}{9x-1}$

d. $\frac{x+9}{x-8}$

e. $\frac{x-9}{x+8}$

_____ 21. Simplify the expression.

$$\frac{9x}{2x-9} + \frac{27}{2x^2-9x} + \frac{3}{x}$$

a. $\frac{3(3x-2)}{2x+9}$

b. $\frac{3(3x+2)}{2x-9}$

c. $\frac{3(3x+7)}{7x-9}$

d. $\frac{3(3x+2)}{2x+5}$

e. $\frac{5(5x+2)}{2x-9}$

_____ 22. Rationalize the denominator.

$$\frac{\sqrt{t}+9}{\sqrt{t}-9}$$

a. $\frac{t+81}{t-81}$

b. $\frac{t-18\sqrt{t}-81}{t+81}$

c. $\frac{t + 18\sqrt{t} + 81}{t - 81}$

d. $\frac{t + 2\sqrt{t} - 9}{t + 9}$

e. $\frac{t^2 + 18t + 81}{t - 81}$

____ 23. Rationalize the denominator.

$$\frac{1}{\sqrt[3]{d} - \sqrt[3]{x}}$$

HINT: Multiply numerator and denominator by $\sqrt[3]{d^2} + \sqrt[3]{dx} + \sqrt[3]{x^2}$

a. $\frac{\sqrt[3]{d^2} + \sqrt[3]{dx} + \sqrt[3]{x^2}}{d - x}$

b. $\frac{\sqrt[3]{d} + \sqrt[3]{x}}{d - x}$

c. $\frac{\sqrt[3]{d^2} + \sqrt[3]{dx} - \sqrt[3]{x^2}}{d + x}$

d. $\frac{\sqrt[3]{d^2} - \sqrt[3]{dx} + \sqrt[3]{x^2}}{d - x}$

e. $\frac{\sqrt[3]{d} - \sqrt[3]{x}}{d + x}$

____ 24. Rationalize the numerator.

$$\frac{\sqrt{4(b+y)+3} - \sqrt{4b+3}}{y}$$

a. $\frac{4y}{\sqrt{4(b+y)+3} + \sqrt{4b+3}}$

b. $\frac{b}{\sqrt{4(b+y)+3} + \sqrt{4b+3}}$

c. $\frac{4}{\sqrt{4(b+y)+3} - \sqrt{4b+3}}$

d. $\frac{4+3}{\sqrt{4(b+y)+3} + \sqrt{4b+3}}$

e. $\frac{4}{\sqrt{4(b+y)+3} + \sqrt{4b+3}}$

____ 25. Express as a sum of terms of the form ax^r , where r is a rational number.

$$\frac{(x^2 + 9)^2}{x^5}$$

- a. $x^{-1} + 9x^{-3} + 18x^{-5}$
- b. $x + 18x^3 + 81x^5$
- c. $x^{-4} + 18x^{-2} + 81$
- d. $x^4 + 18x^2 + 81$
- e. $x^{-1} + 18x^{-3} + 81x^{-5}$

Chapter 1

Answer Section

MULTIPLE CHOICE

1. ANS: C	PTS: 1	MSC: scat12.01.01.4.12m
2. ANS: C	PTS: 1	MSC: scat12.01.01.4.27m
3. ANS: B	PTS: 1	MSC: scat12.01.01.4.33m
4. ANS: D	PTS: 1	MSC: scat12.01.01.4.41m
5. ANS: B	PTS: 1	MSC: scat12.01.01.4.51m
6. ANS: C	PTS: 1	MSC: scat12.01.01.4.58m
7. ANS: A	PTS: 1	MSC: scat12.01.01.4.21m
8. ANS: B	PTS: 1	MSC: scat12.01.02.4.41m
9. ANS: A	PTS: 1	MSC: scat12.01.02.4.45m
10. ANS: C	PTS: 1	MSC: scat12.01.03.4.16m
11. ANS: A	PTS: 1	MSC: scat12.01.03.4.30m
12. ANS: B	PTS: 1	MSC: scat12.01.03.4.39m
13. ANS: D	PTS: 1	MSC: scat12.01.03.4.45m
14. ANS: A	PTS: 1	MSC: scat12.01.03.4.50m
15. ANS: C	PTS: 1	MSC: scat12.01.03.4.55m
16. ANS: A	PTS: 1	MSC: scat12.01.03.4.64m
17. ANS: C	PTS: 1	MSC: scat12.01.03.4.80m
18. ANS: B	PTS: 1	MSC: scat12.01.03.4.95m
19. ANS: E	PTS: 1	MSC: scat12.01.04.4.01m
20. ANS: D	PTS: 1	MSC: scat12.01.04.4.05m
21. ANS: B	PTS: 1	MSC: scat12.01.04.4.23m
22. ANS: C	PTS: 1	MSC: scat12.01.04.4.49m
23. ANS: A	PTS: 1	MSC: scat12.01.04.4.53m
24. ANS: E	PTS: 1	MSC: scat12.01.04.4.57m
25. ANS: E	PTS: 1	MSC: scat12.01.04.4.63m