

Sample Questions to the Final Exam in Math 1111—Chapter P

Section P.1

1. Find the distance between the points -4 and 4 .

- a. -4 b. 4 c. 8 d. 0 e. *None of these*

2. Evaluate: $|-2x| - |-x| - |x|$.

- a. $4x$ b. 0 c. $2x$ d. $3x$ e. *None of these*

Section P.2 Exponents and Scientific Notation

1. Evaluate: $(4^{-2} - 3^{-1})^{-1}$.

- a. 13 b. 5 c. $\frac{13}{48}$ d. $\frac{1}{13}$ e. $-\frac{48}{13}$

2. Simplify: $\left(\frac{12x^4y^{-5}}{-4x^{-5}y^{-8}}\right)^{-2}$.

- a. $6x^2y^{26}$ b. $\frac{6y^6}{y^{18}}$ c. $\frac{6}{x^{18}y^6}$ d. $\frac{y^6}{9x^{18}}$ e. $\frac{1}{9x^{18}y^6}$

3. Simplify: $\left(\frac{-2x^{-1}y^2z^{-2}}{3x^{-2}y^5}\right)^3$.

- a. $-\frac{2x}{3y^3z^2}$ b. $-\frac{6x^4}{9y^6z^5}$ c. $-\frac{8x^3}{27y^9z^6}$ d. $\frac{6x^4}{9y^6z^5}$ e. $\frac{8x^3}{27y^9z^6}$

4. Simplify: $(x^{-3}y)(x^2y^{-\frac{1}{2}})$

- a. $\frac{x^{-1}}{y^{\frac{1}{2}}}$ b. $\frac{1}{xy^{\frac{1}{2}}}$ c. $xy^{\frac{1}{2}}$ d. $\frac{y^{\frac{1}{2}}}{x}$ e. *None of these*

5. Write -0.0000000803 in scientific notation.

- a. -8.03×10^8 b. -8.03×10^{-8} c. 8.03×10^{-8} d. -8.03 e. *None of these*

6. Write -8.03×10^{-5} in decimal notation.

- a. 80300 b. -803000 c. $\frac{1}{(-8.03)^5}$ d. -0.0000803 e. *None of these*

Section P.3 Rational Exponents and Radicals

1. Rationalize the denominator and simplify: $\left(\frac{9}{\sqrt{5} + \sqrt{2}}\right)$

- a. $3(\sqrt{5} + \sqrt{2})$ b. $3(\sqrt{5} - \sqrt{2})$ c. $3(\sqrt{2} - \sqrt{5})$ d. $\sqrt{3}$ e. $\frac{9(\sqrt{5} + \sqrt{2})}{9 + 2\sqrt{10}}$

2. Rationalize the denominator and simplify: $\frac{1}{\sqrt{x} - \sqrt{y}}$.

- a. $\sqrt{x} - \sqrt{y}$ b. \sqrt{x} c. \sqrt{y} d. $\frac{\sqrt{x} + \sqrt{y}}{x - y}$ e. $\frac{\sqrt{x} - \sqrt{y}}{xy}$

3. Express $\sqrt[3]{y^2} \cdot \sqrt[3]{y^5}$ in simplest radical form.

- a. $\sqrt[9]{y^7}$ b. $\sqrt[6]{y^7}$ c. $y^2\sqrt[3]{y}$ d. $y^2\sqrt[6]{y}$ e. $\sqrt[3]{y^7}$

4. Simplify: $\sqrt[3]{64x^4} + 2x\sqrt[3]{8x} + 3\sqrt[3]{27x^4}$.

a. $8x^4\sqrt[3]{x}$ b. $17x\sqrt[3]{x}$ c. $\sqrt[9]{8x}$ d. $x\sqrt[3]{x}$ e. None of these

5. Rationalize the denominator $\frac{\sqrt[3]{xy^2}}{\sqrt[3]{x^2y}}$ and give your answer in the simplest radical form.

a. $\sqrt[3]{xy^2}\sqrt[3]{x^2y}$ b. $\frac{\sqrt[3]{x^2y}}{x}$ c. $\frac{\sqrt[3]{x^5y^4}}{x^2y}$ d. $\frac{\sqrt[3]{xy^2}\sqrt[3]{x^4y^2}}{x^2y}$ e. None of these

Section P.4 Polynomials and special products

1. Perform the indicated operation and simplify: $(3x - 2)^3$.

a. $9x^2 - 9x - 5$ b. $27x^3 - 8$ c. $27x^3 - 54x^2 + 36x - 8$

d. $27x^3 + 54x^2 + 36x + 8$ e. None of these

2. Perform the indicated operation and simplify: $(6x + 5)^2$.

a. $36x^2 - 25$ b. $12x - 10$ c. $36x^2 + 60x + 25$ d. $6x^2 + 25$ e. None of these

3. Evaluate: $(x - y + 1)(2x + 3y - 2)$.

a. $2x^2 - 3y^2 + 5xy + 5y - 2$ b. $2x^2 - 3y^2 + xy - 4x + 5y - 2$ c. $2x^2 - 3y^2 + xy + y - 2$

d. $2x^2 - 3y^2 + xy + 5y - 2$ e. None of these

Section P.5 Factoring

1. Factor completely: $2ax + bx - 2ay - by$.

a. $(a - b)(x + y)$ b. $(2a + b)(x - y)$ c. $(2a + b)(x + y)$ d. $(2a - b)(x + y)$ e. Not Factorable

2. Factor completely: $4x^2 - 9y^4$.

a. $(4x - 9y^2)(4x + 9y^2)$ b. $4x - 36x^2y^4 + 9y^2$ c. $(2x - 3y^2)(2x + 3y^2)$ d. $xy^3(4x - 9y)$ e. Not Factorable

3. Factor completely: $27x^3 + 8$.

a. $(27x - 8)(27x^2 + 8)$ b. $(3x - 2)(3x + 2)$ c. $(3x + 2)^3$ d. $(3x + 2)(9x^2 - 6x + 4)$ e. Not Factorable

4. Factor completely: $2x^3 - 16$.

a. $2x^2(x - 8)$ b. $2(x - 2)(x^2 + 2x + 4)$ c. $(2x + 4)^3$ d. $2(x^2 - 2)(x^2 - 4)$ e. Not Factorable

5. Factor completely: $2x^2 + 5x - 3$.

a. $(2x + 3)(x - 1)$ b. $(x + 1)(2x - 3)$ c. $(2x - 1)(x + 3)$ d. $(2x - 3)(2x + 3)$ e. Not Factorable

6. Factor: $x(x + 1)^{-\frac{1}{2}} + (x + 1)^{\frac{1}{2}}$.

a. $(x + 1)^{-\frac{1}{2}}(2x + 1)$ b. $(x + 1)^{\frac{1}{2}}(2x + 1)$ c. $(x + 1)(2x + 1)^{-\frac{1}{2}}$ d. $(x + 1)(2x + 1)^{\frac{1}{2}}$ e. None of these

Section P.6

1. Find the domain: $\frac{2x+1}{x^2-9}$.

a. All reals b. All reals > 0 c. $x \neq 0$ d. $x \neq -3, 3$ e. None of these

2. Simplify the rational expression completely: $\frac{x^2-25}{5-x}$.

a. $x + 5$ b. $x - 5$ c. $-x - 5$ d. $(x - 5)(x + 5)$ e. None of these

3. Simplify the rational expression completely: $\frac{\frac{3}{x} - \frac{2}{y}}{\frac{5}{x^2} + \frac{7}{y}}$.

a. $15x - 14$ b. $\frac{x(3y-2x)}{5y+7x^2}$ c. $\frac{3y-2x}{5y+7x}$ d. $\frac{3x-2}{12}$ e. *None of these*

4. Simplify the expression $\frac{7x}{x^2-2x-3} - \frac{4x}{x^2-9}$.

a. $\frac{3x^2+25x}{(x+1)(x+3)(x-3)}$ b. $\frac{3x^2+17x}{(x+1)(x+3)(x-3)}$ c. $\frac{3x}{(x+1)(x+3)(x-3)}$ d. $\frac{3x^2+4}{(x+1)(x+3)(x-3)}$ e. *None of these*

5. Simplify the expression $\frac{2x^2+9x-5}{3x^2+15x} \div \frac{4x^2-1}{6x^3-24x^2}$.

a. $\frac{2x(x-5)(x-4)}{(x+5)(2x-1)}$ b. $\frac{(9x-5)(3x-8)}{5}$ c. $\frac{(2x-1)^2(2x+1)}{18x^3(x-4)}$ d. $\frac{2x(x-4)}{2x+1}$ e. *None of these*