

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

Section P.1

1. Use interval notation to represent the inequality $-2 < x \leq 0$.

a. $(-2, 0)$ b. $[-2, 0)$ c. $(-2, 0]$ d. $[-2, 0]$ 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 Radicals

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. 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. $\frac{\sqrt{x}-\sqrt{y}}{xy}$

5. 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. $\sqrt[3]{y^7}$

6. 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

7. 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.3 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.4 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*

Section P.5

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. Find the domain: $\sqrt{x+1}$.

a. *All reals ≥ 0* b. *All reals ≥ -1* c. *All reals ≤ -1* d. $x \neq -1$ e. *None of these*

3. 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*

4. 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*

Section P.6

1. 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*

2. Write the fraction as a sum of two or more terms: $\frac{x^3-5x^2+4}{x^2}$.

a. $x^5 - 5x^4 + 4x^2$ b. $x^6 - 5x^4 + 4$ c. $x - 5 + 4x^{-2}$

d. $x^{\frac{3}{2}} - 5x + 4$ e. *None of these*

Section P.7

1. Find the distance between the points: $(-2, 1)$ and $(3, 4)$.

a. 2.16 b. 3.83 c. 4.18 d. 5.83 e. *None of these*

2. Find the midpoint point: $(-5, -3)$ and $(9, 3)$.

a. $(2, 0)$ b. $(-5, 9)$ c. $(-3, 3)$ d. $(-8, 12)$ e. *None of these*