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: $\left(4^{-2}-3^{-1}\right)^{-1}$.

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

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. $-8.03\text{x}10^{8}$ *b.* $-8.03\text{x}10^{-8}$ *c.* $8.03\text{x}10^{-8}$ *d.* -8.03 *e. None of these*

6. Write $-8.03\text{x}10^{-5}$ 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. $3\left(\sqrt{5}+\sqrt{2}\right)$ **b.** $3\left(\sqrt{5}-\sqrt{2}\right)$ *c.* $3\left(\sqrt{2}-\sqrt{5}\right)$ *d.* $\sqrt{3}$ *e.* $\frac{9\left(\sqrt{5}+\sqrt{2}\right)}{9+2\sqrt{10}}$

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*