

Part I: Multiple Choice

You may do all work for the multiple choice section on scratch paper or below each problem. Attach all scratch work to the back of this test when you turn it in. Write the **CAPITAL LETTER** of the correct response in the blank to the left of the question number.

- _____ 1. Which of the following is **NOT** a factor of $6x^4 + 8x^3 - 24x^2 - 32x$?
- (A) x (B) $x-2$ (C) $x+2$ (D) $3x-4$ (E) $3x+4$

- _____ 2. Simplify the following expression: $\left(\frac{4x^{-2}y^3}{2\sqrt[3]{xy^{-1}}}\right)^{-2}$
- (A) $\frac{y^8}{4\sqrt[3]{x^{14}}}$ (B) $\frac{\sqrt[3]{x^{14}}}{4y^8}$ (C) $\frac{\sqrt[14]{x^3}}{4y^8}$ (D) $\frac{\sqrt[3]{x^{14}}}{2y^8}$ (E) $\frac{2y^8}{\sqrt[14]{x^3}}$

- _____ 3. Rationalize and simplify the following expression: $\frac{x^2 - 9x}{\sqrt{x} - 3}$
- (A) $\sqrt{x^3} + 3x$ (B) $\sqrt[3]{x} + 3x$ (C) $\sqrt{x} + 3x$ (D) $\sqrt{x^3} - 3x$ (E) $\sqrt{x} - 3x$

_____ 4. Simplify: $\sqrt{125} - \sqrt{20}$

- (A) $\sqrt{5}$ (B) $2\sqrt{5}$ (C) $3\sqrt{5}$ (D) $4\sqrt{5}$ (E) $\sqrt{105}$

_____ 5. Solve for the indicated variable: $\frac{k+4}{6} - \frac{k+6}{3} = \frac{1}{4}$

- (A) $\frac{13}{2}$ (B) $\frac{19}{2}$ (C) $\frac{-13}{2}$ (D) $\frac{-19}{2}$ (E) $\frac{29}{2}$

_____ 6. If $x = a$ and $x = b$ are solutions to the conditional equation $4(x^2 + 2) - 3(3x^2 - 1) = -9$, what is the value of $|a \cdot b|$?

- (A) 0 (B) 1 (C) 4 (D) 9 (E) 16

_____ 7. Evaluate: $32^{-3/5}$

- (A) -6 (B) -8 (C) 8 (D) $\frac{-1}{8}$ (E) $\frac{1}{8}$

Part II: Free Response

Show all work in a logical, vertical sequence and use proper notation. Work each problem in the box provided for that answer.

8. If $f(x) = x^2 - 4x - 21$

(a) Evaluate and simplify $f(-2)$

(b) Solve $f(x) = 11$

(c) Solve $f(x) = -21$

(d) Evaluate and simplify completely: $\frac{f(x+h) - f(x)}{h}$.