

Midterm Review Questions

Answers will be found at www.mrmclellan.ca.

1. Which of the following are irrational numbers?

$$\sqrt{4}, \quad \pi, \quad \sqrt{\frac{7}{2}}, \quad \sqrt{\frac{1}{4}}, \quad 4.313131\dots$$

2. Rationalize: $\frac{\sqrt{4}}{\sqrt{5}}$

3. Simplify: $3\sqrt{2} + 5\sqrt{18}$

4. Simplify: $\sqrt{5}(\sqrt{2} + \sqrt{10})$

5. Rationalize: $\frac{\sqrt{2} + 4}{3 - \sqrt{2}}$

6. Write with positive exponents:

$$\left(\frac{x^3 y^{-2}}{3x^{-2} y^4}\right)^{-3}$$

7. Write as a power: $(\sqrt{x^2})^2 (\sqrt[3]{x^2})$

8. Solve: $4^{x+3} = 32^{x-1}$

9. Factor: $x^2 + 4x - 5$

10. Factor: $20x^2 - 5y^2$

11. Factor: $4x^2 + 3xy - 10y^2$

12. Factor: $x^3 + 2x^2 - 4x - 8$

13. What is the remainder when $x^3 - 3x - 5$ is divided by $x - 3$?

14. Simplify: $\frac{x^2 + 2x - 15}{x^2 - 8x + 7} \times \frac{x^2 - 5x - 14}{x^2 + 7x + 10}$

15. Simplify: $\frac{x^2 + 5x + 6}{x^2 - 5x + 6} \div \frac{x^2 - x - 6}{x^2 + x - 6}$

16. Simplify: $\frac{3}{x+2} - \frac{x-1}{x+3}$

17. Simplify: $\frac{4x+1}{x+3} - \frac{x-6}{9-x^2} + 1$

18. Solve: $\frac{2(1-x)}{3} - 8 = \frac{1}{6x} - \frac{2x-3}{3}$

19. Simplify: $\frac{\frac{1}{x+2} - 3}{\frac{2}{x+2} - 1}$