

1. Simplify $\frac{3n^2 - 17n - 6}{6n^2 - 38n + 12}$.

a) $\frac{n+1}{n-2}$

b) $\frac{3n+1}{6n-2}$

c) $\frac{n-1}{n+2}$

d) $\frac{n+3}{n-6}$

e) $\frac{3n-1}{6n+2}$

2. Simplify $\frac{8a^2 - 72a}{a^3 - 8a^2} \cdot \frac{a^2 - 16a + 64}{a^2 - 81}$.

a) $\frac{8a-64}{a^2+9a}$

b) $\frac{a-8}{a^2+9a}$

c) $\frac{8a^2+64}{a^2+9a}$

d) $\frac{8}{a^2+9a}$

e) $\frac{a-16}{a-81}$

3. Simplify $\frac{7}{10x^2y} - \frac{3x}{5y^2}$.

a) $\frac{7-6x^3}{10x^2y^2}$

b) $\frac{7y-6x^3}{10x^2y^2}$

c) $\frac{7y-6x}{10x^2y^2}$

d) $\frac{7y-6x^3}{10x^2y}$

e) $\frac{7-3x}{5x^2y^2}$

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

a) $\frac{-3x+5}{(x+1)(x-3)}$

b) $\frac{-3x+5}{(x-1)(x+3)}$

c) $\frac{3x+5}{(x-1)(x+3)}$

d) $\frac{3x+5}{(x+1)(x-3)}$

e) $\frac{6x-1}{(x-3)(x+1)}$

5. Solve the equation $\frac{a}{a+9} - 2 = \frac{3a}{a+9}$.

a) $\left\{-\frac{9}{2}\right\}$

b) $\left\{-\frac{15}{2}\right\}$

c) $\{-9\}$

d) $\left\{-\frac{11}{2}\right\}$

e) $\{-2\}$

6. Solve the equation for the variable y :

$$-\frac{5}{x-15} = \frac{9}{y-1}$$

a) $y = \frac{9}{5}x + 28$

b) $y = -\frac{9}{5}x + 28$

c) $y = \frac{5}{9}x - 28$

d) $y = -5x + 9$

e) $y = 9x - 5$

7. Simplify $\left(\frac{2^{-1}}{5^{-2}}\right)^{-1}$.

a) $\frac{25}{2}$

b) $\frac{4}{25}$

c) $\frac{2}{25}$

d) $\frac{25}{4}$

e) $\frac{2}{5}$

8. Simplify $\sqrt[3]{54}$.

a) 3

b) $2\sqrt[3]{3}$

c) $3\sqrt[3]{2}$

d) $\sqrt[3]{2}$

e) $2\sqrt[3]{2}$

9. Simplify $3\sqrt[3]{2} + 2\sqrt[3]{16} - 3\sqrt[3]{54}$.

- a) $-2\sqrt[3]{3}$
- b) $-2\sqrt[3]{2}$
- c) $2\sqrt[3]{2}$
- d) $2\sqrt[3]{3}$
- e) $3\sqrt[3]{4}$

10. Simplify $\frac{\sqrt[3]{20xy}}{\sqrt[3]{5x^2y^5}}$.

- a) $\frac{4\sqrt[3]{xy}}{xy^2}$
- b) $\frac{2\sqrt[3]{x^2y^2}}{xy^2}$
- c) $\frac{\sqrt[3]{4xy}}{y}$
- d) $\frac{\sqrt[3]{4x^2y^2}}{xy^2}$
- e) $\sqrt[3]{100xy^4}$

11. Rationalize the denominator and simplify $\frac{\sqrt{a}}{\sqrt{a}-10}$.

- a) \sqrt{a}
- b) $\frac{11a}{a-100}$
- c) $\frac{a+10\sqrt{a}}{a-100}$
- d) $\frac{a+10\sqrt{a}}{a-10}$
- e) $\frac{a+10\sqrt{a}}{a^2-100}$

12. Solve $\sqrt{-4x+9} = x-1$.

- a) $\{2\}$
- b) $\{-1\}$
- c) $\{1\}$
- d) $\left\{-\frac{9}{4}\right\}$
- e) $\{5\}$

13. Simplify $\frac{\sqrt[3]{5}}{\sqrt[3]{5}}$.

- a) $\sqrt[12]{25}$
- b) $\frac{1}{\sqrt[12]{5}}$
- c) $\sqrt[12]{5}$
- d) $\sqrt[3]{5}$
- e) $\frac{1}{\sqrt{5}}$

14. Write $(8+7i)^2$ in standard form.

- a) $15-112i$
- b) $-15-112i$
- c) $15+112i$
- d) $112+15i$
- e) $64+49i$

15. Solve the quadratic equation $(x-9)^2 = 9$.

- a) $\{6, 12\}$
- b) $\{-6, 6\}$
- c) $\{-3, 3\}$
- d) $\{-12, 12\}$
- e) $\{-9, 9\}$

16. Use the method of completing the square and rewrite the equation $x^2 + 6x - 12 = 0$.

- a) $(x+3)^2 = 21$
- b) $(x-3)^2 = 21$
- c) $(x-21)^2 = 3$
- d) $(x+21)^2 = 3$
- e) $(x+3)^2 = -21$

17. Solve $-42k^2 + 2k + 1 = 0$.

- a) $\frac{-1 \pm \sqrt{43}}{42}$
- b) $\frac{-1 \pm i\sqrt{43}}{42}$
- c) $\frac{1 \pm i\sqrt{43}}{42}$
- d) $\frac{\pm 1 - i\sqrt{43}}{42}$
- e) $\frac{1 \pm \sqrt{43}}{42}$

18. Solve $n + \frac{15}{n} = \frac{113}{6}$.

- a) $\left\{-18, \frac{5}{6}\right\}$
- b) $\left\{-18, -\frac{5}{6}\right\}$
- c) $\left\{\frac{5}{6}, 18\right\}$
- d) $\left\{-\frac{5}{6}, 18\right\}$
- e) $\{-15, 113\}$

19. Solve the inequality $x^2 + 2x - 15 < 0$.

- a) (3, 5)
- b) (-5, 3)
- c) (-3, 5)
- d) (-15, 2)
- e) (-2, 15)

20. Solve the inequality $\frac{x-2}{x-4} \leq 2$.

- a) $(-\infty, -6) \cup (-4, \infty)$
- b) (4, 6)
- c) $(-\infty, 4) \cup (6, \infty)$
- d) $(-\infty, 2) \cup (4, \infty)$
- e) $(-\infty, \infty)$

21. Find the vertex of the parabola $y = (x+1)^2 - 7$.

- a) (-1, -7)
- b) (1, 7)
- c) (-1, 7)
- d) (2, -7)
- e) (-1, -1)

22. Find the center of the circle $x^2 + y^2 - 16x - 36y - 573 = 0$.

- a) (18, -8)
- b) (-8, -18)
- c) (18, 8)
- d) (8, 18)
- e) (-18, -8)

23. Write the equation of the circle with center at (0, 0) and the length of a radius $r = \sqrt{33}$.

- a) $x^2 + y^2 = 1089$
- b) $x^2 + y^2 = 1$
- c) $33(x^2 + y^2) = 1$
- d) $x^2 + y^2 = 33$
- e) $x^2 + y^2 = \sqrt{33}$

24. What is the graph of $4x^2 + 9y^2 = 49$?

- a) point
- b) circle
- c) ellipse
- d) parabola
- e) hyperbola

25. Find the intercepts for the equation $25x^2 - 4y^2 = 9$.

- a) (3, 0) and (-3, 0)
- b) $\left(0, \frac{5}{2}\right)$ and $\left(0, -\frac{5}{2}\right)$
- c) $\left(\frac{5}{2}, 0\right)$ and $\left(-\frac{5}{2}, 0\right)$
- d) $\left(\frac{3}{5}, 0\right)$ and $\left(-\frac{3}{5}, 0\right)$
- e) $\left(0, \frac{3}{5}\right)$ and $\left(0, -\frac{3}{5}\right)$

26. Solve $\begin{cases} \frac{1}{2}x - \frac{1}{3}y = 12 \\ x + 4y = -74 \end{cases}$.

- a) (10, 21)
- b) (-21, 10)
- c) (10, -21)
- d) infinitely many solutions
- e) no solutions

27. Sue bought 2 packages of cookies and 6 sacks of potato chips for \$10.20. Later she bought 5 packages of cookies and 4 sacks of potato chips for \$9.00. Find the price of a package of cookies.

- a) \$0.55
- b) \$.070
- c) \$0.60
- d) \$0.50
- e) \$0.75

28. Solve $\begin{cases} 5x + 4y = -7 \\ 4x - 11y = 37 \end{cases}$.

- a) (3, 1)
- b) (3, -1)
- c) (1, -3)
- d) infinitely many solutions
- e) no solutions

29. Solve $\begin{cases} \frac{2x}{3} - \frac{3y}{4} = 60 \\ \frac{9x}{5} + \frac{y}{5} = 73 \end{cases}$.

- a) (45, -40)
- b) (45, 40)
- c) (-45, 40)
- d) no solution
- e) infinitely many solutions.

30. A small-town library buys a total of 51 books that cost \$827. Some of the books cost \$15 each, and the remainder cost \$17 per book. How many books of each price did they buy?

- a) 20 books that cost \$15, 31 books that cost \$17
- b) 19 books that cost \$15, 32 books that cost \$17
- c) 32 books that cost \$15, 19 books that cost \$17
- d) 10 books that cost \$15, 41 books that cost \$17
- e) 31 books that cost \$15, 20 books that cost \$17

FALL 06 MATH 021 FINAL

ITEM NO. FORM: A

- | | |
|----|---|
| 1 | B |
| 2 | A |
| 3 | B |
| 4 | B |
| 5 | A |
| 6 | B |
| 7 | C |
| 8 | C |
| 9 | B |
| 10 | D |
| 11 | C |
| 12 | A |
| 13 | C |
| 14 | C |
| 15 | A |
| 16 | A |
| 17 | E |
| 18 | C |
| 19 | B |
| 20 | C |
| 21 | A |
| 22 | D |
| 23 | D |
| 24 | C |
| 25 | D |
| 26 | C |
| 27 | C |
| 28 | C |
| 29 | A |
| 30 | A |