1. Simplify $\dfrac{3n^2-23n-8}{3n^2-26n+16}$.

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

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

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

   d) $\dfrac{n+3}{n-3}$

   e) $\dfrac{3n-8}{3n+16}$

2. Simplify $\dfrac{x^2+2x-48}{42-x-x^2}$.

   a) $-\dfrac{x+8}{x+7}$

   b) $\dfrac{x+8}{6-x}$

   c) $\dfrac{x-8}{7-x}$

   d) $\dfrac{x+8}{x-6}$

   e) $\dfrac{x-48}{42-x}$

3. Simplify $\dfrac{9x^5y^5}{10x^6y^4} \div \dfrac{117}{50x^5}$.

   a) $\dfrac{13xy^5}{5}$

   b) $\dfrac{5yx^6}{13}$

   c) $\dfrac{13xy^4}{5}$

   d) $\dfrac{5yx^4}{13}$

   e) $\dfrac{9}{50yx^4}$

4. Simplify $\dfrac{6a^2-24a}{a^3-2a^2} \cdot \dfrac{a^2-4a+4}{a^2-16}$.

   a) $\dfrac{6a^2+12}{a(a+4)}$

   b) $\dfrac{6}{a(a+4)}$

   c) $\dfrac{a-2}{a(a+4)}$

   d) $\dfrac{6a-12}{a(a+4)}$

   e) $\dfrac{6}{a+4}$

5. Subtract and simplify $\dfrac{5}{3n} - \dfrac{12}{4n^2}$.

   a) $\dfrac{5n+9}{4n^2}$

   b) $\dfrac{5n-9}{3n^2}$

   c) $\dfrac{5n-9}{3n}$

   d) $\dfrac{5n-36}{12n^2}$

   e) $\dfrac{-7}{3-4n}$

6. Simplify $\dfrac{a-1}{a} - \dfrac{4}{a+4}$.

   a) $\dfrac{a^2+a+4}{a(a+4)}$

   b) $\dfrac{a^2-2a-4}{a(a+4)}$

   c) $\dfrac{a^2-a+4}{a(a+4)}$

   d) $\dfrac{a^2-a-4}{a(a+4)}$

   e) $\dfrac{a-5}{4}$

7. Simplify $\dfrac{16}{x^2+2x-3} - \dfrac{2}{x-1} - \dfrac{9}{x+3}$.

   a) $\dfrac{-11x+19}{(x-1)(x+3)}$

   b) $\dfrac{-11x+19}{(x+1)(x-3)}$

   c) $\dfrac{11x+19}{(x+1)(x-3)}$

   d) $\dfrac{11x+19}{(x-1)(x+3)}$

   e) $\dfrac{5}{x^2-5}$

8. Simplify $\dfrac{\frac{3}{28x}}{\frac{12}{7xy}}$.

   a) $\dfrac{y}{16}$

   b) $\dfrac{y}{4}$

   c) $\dfrac{x}{4y}$

   d) $\dfrac{xy}{16}$

   e) $16y$

9. Solve the equation $\frac{1}{n} + \frac{1}{6} = \frac{11}{3n}$.

a) $n = 20$

b) $n = 17$

c) $n = 14$

d) $n = 21$

e) $n = 16$

10. Solve the equation $\frac{2x+1}{6} = \frac{1}{x}$.

a) $\{\frac{5}{2}, 6\}$

b) $\{\frac{3}{2}, -2\}$

c) $\{-\frac{5}{6}, -6\}$

d) $\{-\frac{3}{2}, 2\}$

e) $\{2, 6\}$

11. Solve the equation $\frac{x}{x-3} - \frac{5}{x+11} = \frac{87}{x^2+8x-33}$.

a) $\{6, 12\}$

b) $\{6, -12\}$

c) $\{-6, 12\}$

d) $\{3, -11\}$

e) $\{-5, 87\}$

12. If two inlet pipes are both open, they can fill a pool in 2 hours and 30 minutes. One of the pipes can fill the pool by itself in 3 hours. How long, in hours, would it take the other pipe to fill the pool by itself?

a) 15 hours

b) 12 hours

c) 3 hours

d) 2 hours

e) 24 hours

13. Simplify $(3^{-2} + 2^{-2})^{-1}$.

a) $\frac{13}{36}$

b) $\frac{31}{36}$

c) $\frac{36}{13}$

d) 5

e) $\frac{1}{5}$

14. Simplify $(ab^6c^{-3})^{-9}$.

a) $a^9b^{54}c^{27}$

b) $\frac{c^{27}}{a^9b^{54}}$

c) $\frac{a^9b^{54}}{c^{27}}$

d) $\frac{1}{a^9b^{54}c^{27}}$

e) $\frac{c^{12}}{a^9b^{15}}$

15. Change the radical $-\frac{3}{8}\sqrt{12}$ to simplest radical form.

a) $-\frac{\sqrt{3}}{4}$

b) $3\sqrt{3}$

c) $-3\sqrt{3}$

d) $-\frac{3\sqrt{3}}{4}$

e) $\frac{4}{3\sqrt{3}}$

16. Change the radical $\frac{\sqrt{40}}{\sqrt{12}}$ to simplest radical from.

a) $\frac{\sqrt{30}}{12}$

b) $\frac{\sqrt{30}}{3}$

c) $3\sqrt{30}$

d) $\frac{\sqrt{40}}{12}$

e) $\frac{\sqrt{10}}{3}$

17. Simplify $-\frac{2}{3}\sqrt{18}+\frac{4}{5}\sqrt{18}-\frac{5}{6}\sqrt{18}$.

a) $-\frac{21}{10}\sqrt{2}$

b) $-\frac{14}{15}\sqrt{2}$

c) $\frac{26}{25}\sqrt{2}$

d) $-\frac{1}{21}\sqrt{2}$

e) $\frac{3}{4}\sqrt{18}$

18. Simplify $5\sqrt{40x^5}-4\sqrt{90x^5}+3\sqrt{160x^5}$.

a) $10x\sqrt{10x}$

b) $10x^2\sqrt{10}$

c) $10x^2\sqrt{10x}$

d) $10x^3$

e) $4\sqrt{x^5}$

19. Multiply and simplify $(\sqrt{3a}+\sqrt{13y})(\sqrt{3a}-\sqrt{13y})$.

a) $6\sqrt{a}+26\sqrt{y}$

b) $2\sqrt{3a}+2\sqrt{13y}$

c) $3a+13y$

d) $13a-3y$

e) $3a-13y$

20. Rationalize the denominator and simplify $\frac{6}{\sqrt{6}+1}$.

a) $6(\sqrt{6}-1)$

b) $\frac{6\sqrt{6}-1}{5}$

c) $\frac{5(\sqrt{6}-1)}{6}$

d) $\frac{6(\sqrt{6}+1)}{5}$

e) $\frac{6(\sqrt{6}-1)}{5}$