

Algebra 2 Unit 7 Test Review

Simplify using only positive exponents.

$$1) \left(\frac{3a^3b^7}{4b^{-2}a^6c^0} \right)^2 = \left(\frac{3b^9}{4a^3} \right)^2$$

$$2) \left(\frac{r^{-1}s^3}{t} \right)^{-4} = \left(\frac{s^3}{tr} \right)^{-4} = \left(\frac{tr}{s^3} \right)^4$$

$$3) \frac{(12x^2y^3)^2}{8x^4y^7} = \frac{144x^4y^6}{8x^4y^7}$$

$$4) \frac{(x^4x^{-2})^3}{x^{-5}} = \frac{x^{12}x^{-6}}{x^{-5}} = \frac{x^{12} \cdot x^5}{x^6}$$

$$1) \frac{9b^{18}}{16a^6}$$

$$2) \frac{t^4r^4}{s^{12}}$$

$$3) \frac{18}{y}$$

$$4) x^{11}$$

Simplify the radical expressions. Assume all variables are positive.

$$5) \sqrt[4]{16x^{36}y^{48}}$$

$$6) \frac{\sqrt{48x^3}}{\sqrt{3xy^4}} = \sqrt{\frac{16x^2}{y^4}}$$

$$7) \sqrt{5x^4y^3} \cdot \sqrt{45x^3y} = \sqrt{\underset{25}{5 \cdot 5 \cdot 9} \cdot x^6 \cdot x^1 \cdot y^4}$$

$$8) \frac{\sqrt[3]{250x^7y^3}}{\sqrt[3]{2x^2y}} = \sqrt[3]{125x^5y^2} = \sqrt[3]{125 \cdot x^3 \cdot x^2 \cdot y^2}$$

$$9) \sqrt[4]{\frac{625}{81}}$$

$$10) \sqrt[3]{-\frac{250}{2}} = \sqrt[3]{-125}$$

$$5) 2x^9y^{12}$$

$$6) \frac{4x}{y^2}$$

$$7) 15x^3y^2\sqrt{x}$$

$$8) 5x\sqrt[3]{x^2y^2}$$

$$9) \frac{5}{3}$$

$$10) -5$$

Perform the indicated operation.

11) $6\sqrt[4]{5x} - 4\sqrt[4]{5x}$

11) $5\sqrt[4]{5x}$

12) $3\sqrt{x} - 5\sqrt{x}$

12) $-2\sqrt{x}$

13) $4\sqrt{27} + 6\sqrt{3}$
 $4\sqrt{9 \cdot 3} + 6\sqrt{3}$
 $12\sqrt{3} + 6\sqrt{3}$

13) $18\sqrt{3}$

14) $\sqrt[3]{54} + \sqrt[3]{16}$
 $\sqrt[3]{27 \cdot 2} + \sqrt[3]{8 \cdot 2}$
 $3\sqrt[3]{2} + 2\sqrt[3]{2}$

14) $5\sqrt[3]{2}$

15) $(4 + \sqrt{7})(4 - \sqrt{7})$

15) 9

Rationalize each denominator. Simplify the answer.

16) $\frac{(\sqrt{3} - \sqrt{2}) \cdot \frac{\sqrt{2}}{\sqrt{2}}}{\sqrt{8}} = \frac{\sqrt{6} - 2}{\sqrt{16}}$

16) $\frac{\sqrt{6} - 2}{4}$

17) $\frac{\sqrt{5} + 1}{2 - \sqrt{3}} \cdot \frac{2 + \sqrt{3}}{2 + \sqrt{3}} = \frac{2\sqrt{5} + \sqrt{15} + 2 + \sqrt{3}}{4 - 3}$

17) $2\sqrt{5} + \sqrt{15} + 2 + \sqrt{3}$

18) Write the exponential expression $(4x)^{\frac{5}{11}}$ in radical form.

18) $\sqrt[11]{(4x)^5}$

19) Write the exponential expression $2x^{\frac{2}{7}}$ in radical form.

19) $2\sqrt[7]{x^2}$

20) Write $3\sqrt[3]{y^2}$ in exponential form.

20) $3y^{\frac{2}{3}}$

Simplify.

21) $16^{\frac{3}{4}}$

$$2^3 = \boxed{8}$$

22) $(81x^{-8})^{\frac{1}{4}}$

$$\left(\frac{x^8}{81}\right)^{\frac{1}{4}} = \boxed{\frac{x^2}{3}}$$

23) $3^{\frac{1}{3}} \cdot 3^{\frac{2}{3}}$

$$\boxed{3}$$

24) $64^{-0.5}$

$$\boxed{\frac{1}{8}}$$

Solve. Check for EXTRANEIOUS Solutions.

25) $\sqrt{x-2} + 6 = 10$

$$\sqrt{x-2} = 4$$

$$x-2 = 16$$

25) $x = 18$

26) $2(3x-6)^{\frac{2}{3}} + 7 = 25$

$$(3x-6)^{\frac{2}{3}} = 9$$

$$3x-6 = \pm 3^3$$

$$3x-6 = 27$$

$$3x = 33$$

$$x = 11$$

$$3x-6 = -27$$

$$3x = -21$$

$$x = -7$$

26) $x = -7$

Let $f(x) = 6 - 3x$ and $g(x) = x^2 - 3$. Find:

27) $(f+g)(x)$

$$\underline{x^2 - 3x + 3}$$

28) $(f-g)(-1)$

$$9 - (-2) = \boxed{11}$$

29) $f(x) \cdot g(x)$

$$\underline{-3x^3 + 6x^2 + 9x - 18}$$

30) $\left(\frac{f}{g}\right)(2) = \boxed{0}$

31) $(g \circ f)(0) = \boxed{33}$

32) $(f \circ g)(4)$

$$6 - 3(13)$$

$$6 - 39 = \boxed{-33}$$

Let $f(x) = 4x - 2$ and $g(x) = -3x - 1$. Find:

33) $f(2) + g(3)$

$$6 + (-10) = \boxed{-4}$$

34) $(f \circ g)(x)$

$$4(-3x-1) - 2$$

$$\underline{-12x - 6}$$

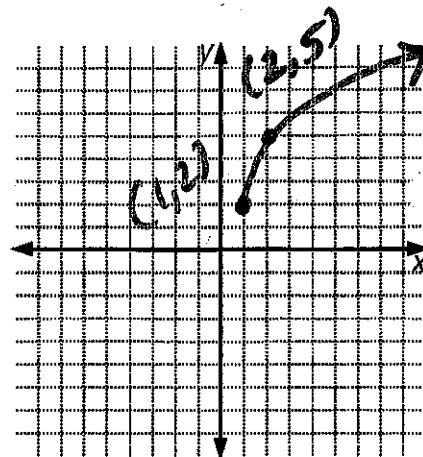
35) $f^{-1}(f(-2))$

$$\boxed{-2}$$

Graph. (Label 2 points and state the domain and range)

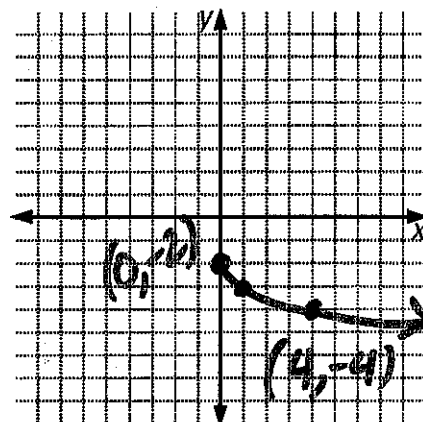
36) $y = 3\sqrt{x-1} + 2$

D: $[1, +\infty)$
R: $[2, +\infty)$



37) $y = -\sqrt{x} - 2$

D: $[0, +\infty)$
R: $(-\infty, -2]$



Find the inverse. Is the inverse a function?

38) $f(x) = 8x - 6$

$x = 8y - 6$
 $x + 6 = 8y$

38) $f^{-1}(x) = \frac{x+6}{8}$

Yes

39) $g(x) = -4 + 3x^2$

$x = -4 + 3y^2$
 $x + 4 = 3y^2$

39) $y^{-1} = \pm \sqrt{\frac{x+4}{3}}$

No

40) Given $f(x) = \sqrt{2+x}$

a) Find f^{-1} .

$x = \sqrt{2+y}$
 $x^2 = 2+y$
 $f^{-1}(x) = x^2 - 2$

b) Find the domain and range of f^{-1}

$f(x)$:
D: $[-2, +\infty)$
R: $[0, +\infty)$

$f^{-1}(x)$:
D: $[0, +\infty)$
R: $[-2, +\infty)$