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Alg 2 Topic 5 Test Practice

B 1. Find all the real square roots of 144.

a. 12 c. –12

(b.) 12 and –12 d. $12i$ and $-12i$

$x^2=144$ → $x=\pm 12$

$x^2-144=0$

$(x-12)(x+12)=0$

A 2. Find all the real square roots of $-\frac{9}{16}$.

(a.) no real root c. $-\frac{3}{4}$ and $\frac{3}{4}$

b. $-\frac{3}{4}$ d. $\frac{81}{256}$

$x^2=-\frac{9}{16}$ negative … $\sqrt{x^2}=\pm\sqrt{-\frac{9}{16}}$ … $x=\pm\frac{3}{4}i$

$x^2+\frac{9}{16}=0$

$(\quad)(\quad)=0$ imag roots

B 3. Find all the real cube roots of 27.

a. –3 and 3 c. $3i$

(b.) 3 d. $3i$ and $-3i$

$x^3=27$

$x^3-27=0$

$(x-3)(x^2+3x+9)=0$

$x-3=0$ → $x=3$

$x^2+3x+9=0$ imag roots

Which is a simpler form of the radical expression?

A 4. $\sqrt[4]{81x^{20}y^8}$

(a.) $3|x^5|y^2$ b. $9|x^{25}|y^4$ c. $9x^{25}|y^4|$ d. $3x^5|y^2|$

$\sqrt[4]{3^4x^{\frac{20}{4}}y^{\frac{8}{4}}} \rightarrow 3|x^5|y^2|$ abs value needed because of fourth root (even)

C 5. $\sqrt[3]{27x^{15}y^{24}}$

a. $3x^5|y^8|$ b. $9x^{15}|y^{24}|$ (c.) $3x^5y^8$ d. $9|x^{15}|y^{24}$

$\sqrt[3]{3^3x^{\frac{15}{3}}y^{\frac{24}{3}}} \rightarrow 3x^5y^8$ abs value not needed because cube root. (odd)

A 6. Write the exponential expression $3x^{\frac{3}{8}}$ in radical form.

(a.) $3\sqrt[8]{x^3}$ b. $\sqrt[8]{3x^3}$ c. $3\sqrt[3]{x^8}$ d. $3^{\frac{3}{8}}\sqrt[8]{x^3}$

only x

C 7. Write the radical expression $\frac{8}{\sqrt[7]{x^{15}}}$ in exponential form.

a. $8x^{-\frac{7}{15}}$ b. $8x^{\frac{15}{7}}$ (c.) $8x^{-\frac{15}{7}}$ d. $8x^{\frac{7}{15}}$

reciprocate

What is the simplest form of the number?

A 8. $(-27)^{\frac{2}{3}}$

(a.) 9 c. –28

b. 57 d. –18

add parentheses

$-1\cdot 27^{\frac{2}{3}} \rightarrow -1\cdot\sqrt[3]{27\cdot 27} \rightarrow -1\cdot\sqrt[3]{333\cdot 333} \rightarrow -1\cdot 3\cdot 3$

typo

not part of 27

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B 9. $\sqrt{2}\left(\sqrt[8]{2}\right)$ $2^{\frac{1}{2}} \cdot 2^{\frac{1}{8}} \to 2^{\frac{1}{2}+\frac{1}{8}} \to 2^{\frac{4}{8}+\frac{1}{8}} \to 2^{\frac{5}{8}}$

a. 1024
b. $2^{\frac{5}{8}}$
c. $2^{\frac{8}{5}}$
d. $2^{\frac{1}{10}}$

A 10. Write $(8a^{-3})^{-\frac{2}{3}}$ in simplest form.

a. $\frac{a^2}{4}$ $8^{-\frac{2}{3}}(a^{-3})^{-\frac{2}{3}} \to 8^{-\frac{2}{3}}a^2 \to \frac{a^2}{8^{2/3}} \to \frac{a^2}{\sqrt[3]{8}\cdot\sqrt[3]{8}} \to \frac{a^2}{2\cdot 2} \to \frac{a^2}{4}$
b. $4a^2$
c. $\frac{1}{4a^2}$
d. none of these

A 11. What is $\frac{\sqrt[3]{x^3}}{\sqrt[5]{x^2}}$ in simplest form? rationalize

a. $x^{\frac{3}{5}}$ $\frac{x^{\frac{3}{3}}\cdot\sqrt[5]{x^3}}{\sqrt[5]{x^2}\cdot\sqrt[5]{x^3}} \to \frac{x\sqrt[5]{x^3}}{x} \to x^{\frac{9}{15}} \to x^{\frac{3}{5}}$
b. $x^{\frac{5}{3}}$
c. $x^{\frac{9}{15}}$
d. $x^{\frac{15}{9}}$

or $\frac{x^{\frac{3}{3}}}{x^{\frac{2}{5}}} \to x^{\frac{3}{3}-\frac{2}{5}} \to x^{\frac{15}{15}-\frac{6}{15}} \to x^{\frac{9}{15}} \to x^{\frac{3}{5}}$

What is the simplest form of the expression?

A 12. $\sqrt[3]{108a^{16}b^9}$ $36 \to 3\cdot 12 \to 3\cdot 3\cdot 4$ $a^{\frac{16}{3}}b^{\frac{9}{3}} \to 3a^5b^3\sqrt[3]{4a}$

a. $3a^5b^3\sqrt[3]{4a}$
b. $4a^5b^3\sqrt[3]{3a}$
c. $3a^5b^3\sqrt[3]{a}$
d. none of these

leftover $a^{\frac{15}{3}}$ leftover $b^{\frac{3}{3}}$

Multiply and simplify if possible.

A 13. $\sqrt{6}\cdot\sqrt{2}$ $\sqrt{6\cdot 2} \to 2\sqrt{3}$

a. $2\sqrt{3}$
b. $\sqrt{12}$
c. $3\sqrt{2}$
d. not possible

A 14. $\sqrt{7x}\left(\sqrt{x} - 7\sqrt{7}\right)$ $\sqrt{7x^2} - 7\sqrt{7^2x}$

a. $x\sqrt{7} - 49\sqrt{x}$ $\to x\sqrt{7} - 7\cdot 7\sqrt{x} \to x\sqrt{7} - 49\sqrt{x}$
b. $\sqrt{7x} - 49x$
c. $x\sqrt{7} - x\sqrt{49}$
d. $-\sqrt{42x}$

What is the simplest form of the product?

B 15. $\sqrt{50x^7y^7}\cdot\sqrt{6xy^4}$ $\sqrt{50\cdot 6\cdot x^7\cdot x\cdot y^7\cdot y^4} \to 25\cdot x^4y^5\sqrt{y\cdot 3}$ x^8 y^{11} 25

a. $2x^4y^6\sqrt{75y}$
b. $10x^4y^5\sqrt{3y}$
c. $5x^4y^6\sqrt{12}$
d. $30x^4y^5\sqrt{y}$

leftover $\to 10x^4y^5\sqrt{3y}$

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B 16. $\frac{\sqrt[3]{270x^{20}}}{\sqrt[3]{5x}}$

a. $2x\sqrt[3]{3x^6}$ b. $3x^6\sqrt[3]{2x}$ c. $\sqrt[3]{135x^{19}}$ d. $3x^6\sqrt{135x}$

B 17. $\frac{\sqrt[3]{9}}{\sqrt[3]{11}}$ rationalize

a. $\frac{\sqrt[3]{99}}{11}$ b. $\frac{\sqrt[3]{1089}}{11}$ c. $11\sqrt[3]{99}$ d. none of these

What is the simplest form of the radical expression?

C 18. $3\sqrt{2a} - 6\sqrt{2a}$

a. $-6\sqrt{2a}$ c. $-3\sqrt{2a}$

b. $9\sqrt{2a}$ d. not possible to simplify

What is the simplest form of the expression?

A 19. $\sqrt{20} + \sqrt{45} - \sqrt{5}$

a. $4\sqrt{5}$ c. $13\sqrt{5}$

b. $6\sqrt{5}$ d. $5\sqrt{5}$

What is the product of the radical expression?

B 20. $(7 - \sqrt{2})(8 + \sqrt{2})$

a. $54 + 56\sqrt{2}$ c. $13 + 15\sqrt{2}$

b. $54 - \sqrt{2}$ d. $58 + 56\sqrt{2}$

A 21. $(5 - \sqrt{2})(5 + \sqrt{2})$ Conjugates FOIL

a. 23 c. 27

b. 20 d. 18

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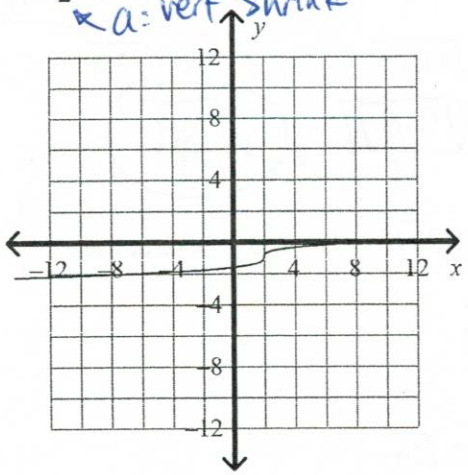
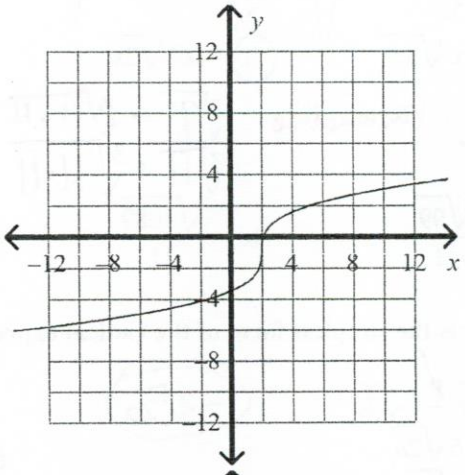
D 22. $y = 1 + \frac{1}{2}\sqrt[3]{x-2}$ k: up 1, h: 2 right, a: vert shrink

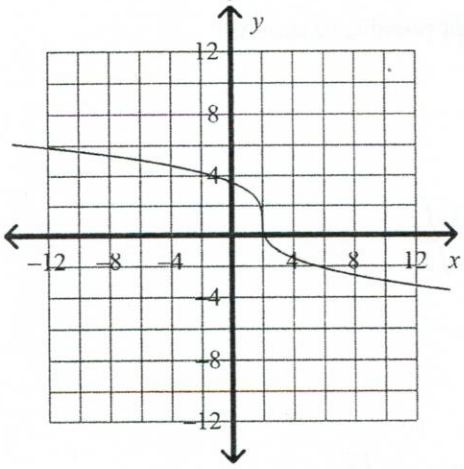
a.



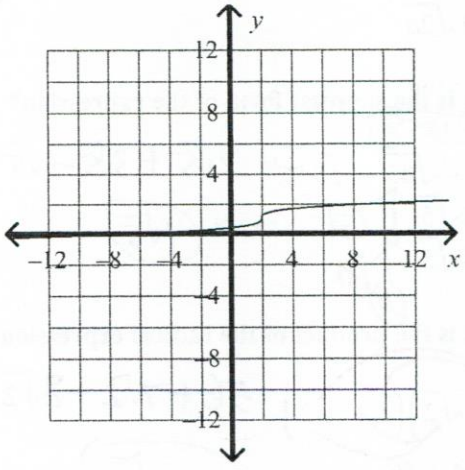
c.



b.



(d.)



What is the solution of the equation?

D 23. $\sqrt{x+10} - 7 = -5 \rightarrow \sqrt{x+10} = 2$

a. 14 +7 +7 b. −8 $(\ )^2 = (\ )^2$ c. 4 (d.) −6

$x+10 = 4$

$x = -6$

C 24. $(x+6)^{\frac{3}{5}} = 8$

a. 14 $(\ )^{5/3}(\ )^{5/3}$ b. 2 $\rightarrow x+6 = 8^{5/3}$ c. 26 $x+6 = 32 \rightarrow x = 26$ d. 38

C (25.) What is the solution of $\sqrt{5x+1} - \sqrt{x} = 5$?

$\sqrt{5x+1} = 5 + \sqrt{x}$

$(\ )^2 \quad (\ )^2$

$5x+1 = (5+\sqrt{x})^2 \rightarrow 5x+1 = (5+\sqrt{x})(5+\sqrt{x})$

a. $x = 0$ c. $x = 16$

b. $x = 16$ and $x = 0$ d. $x = 16$ and $x = 1$

$5x+1 = 25 + 5\sqrt{x} + 5\sqrt{x} + x$

$-25 \quad -25 \quad -x$

$4x - 24 = 10\sqrt{x}$ ÷2

$(2x-12)^2 = (5\sqrt{x})^2$

$4x^2 - 48x + 144 = 25x$

ugh...

Check answers

B 26. Let $f(x) = 3x + 2$ and $g(x) = x - 3$. Find $f(x) - g(x)$.

a. $2x - 5$ b. $2x + 5$ c. $4x - 1$ d. $2x - 1$

$(3x+2) - (x-3)$

$\rightarrow 3x+2-x+3$

$\rightarrow 2x+5$

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C 27. Let $f(x) = 3x + 2$ and $g(x) = 7x + 6$. Find $f \cdot g$ and its domain.

a. $6x^2 + 4x + 42$; all real numbers except $x = -\frac{2}{3}$

b. $6x^2 + 4x + 42$; all real numbers

c. $21x^2 + 32x + 12$; all real numbers

d. $21x^2 + 32x + 12$; all real numbers except $x = -\frac{6}{7}$

D 28. Let $f(x) = x^2 - 16$ and $g(x) = x + 4$. Find $\frac{f}{g}$ and its domain.

a. $x + 4$; all real numbers except $x \neq 4$

b. $x + 4$; all real numbers except $x \neq -4$

c. $x - 4$; all real numbers except $x \neq 4$

d. $x - 4$; all real numbers except $x \neq -4$

B 29. Let $f(x) = -2x - 7$ and $g(x) = -4x + 3$. Find $(f \circ g)(-5)$.

a. 23 b. –53 c. –9 d. 3

D 30. Is relation t a function? Is the inverse of relations t a function?

Relation t

x	0	2	4	6
y	–8	–7	–4	–4

a. Relation t is not a function. The inverse of relation t is a function.

b. Relation t is not a function. The inverse of relation t is not a function.

c. Relation t is not a function. The inverse of relation t is a function.

d. Relation t is a function. The inverse of relation t is not a function.

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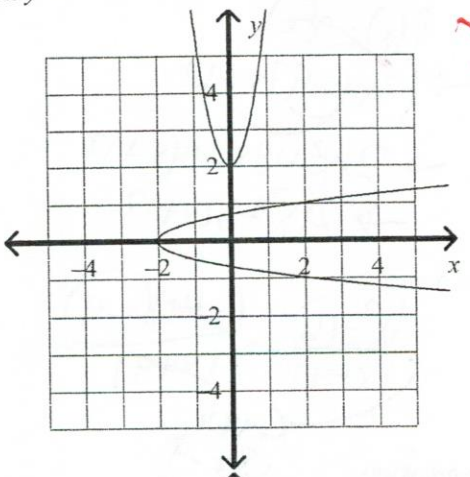
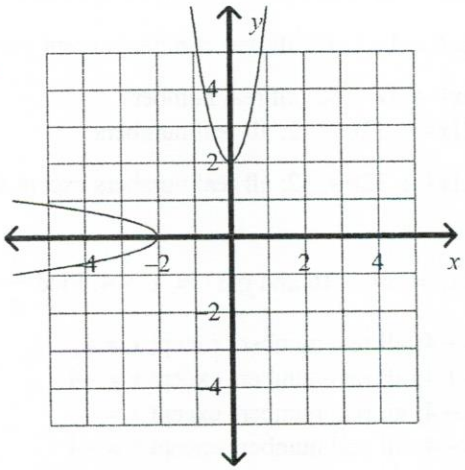
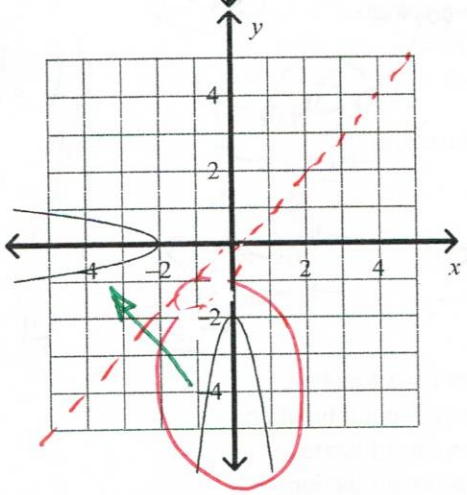
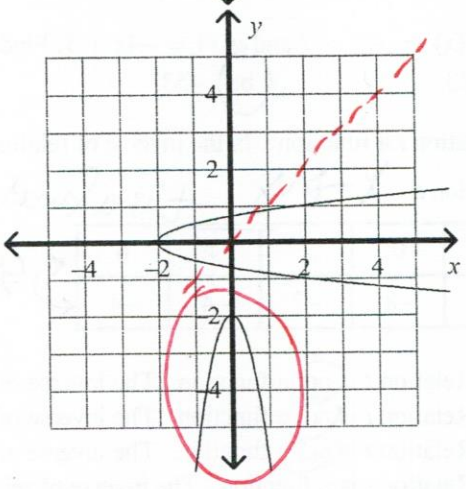
B 31. Graph $y = -4x^2 - 2$ and its inverse.

a. 

c. 

b. 

d. 

What is the inverse of the given relation?

A 32. $y = 7x^2 - 3$.

a. $y = \pm\sqrt{\dfrac{x+3}{7}}$

b. $x = \sqrt{\dfrac{y+3}{7}}$

c. $y^2 = \dfrac{x-3}{7}$

d. $y = \pm\sqrt{\dfrac{x-3}{7}}$

D 33. For the function $f(x) = \sqrt{x-5}$, find f^{-1}. What is the range of f^{-1}?

a. $f^{-1}(x) = x^2 + 25;\ y \geq 25$

b. $f^{-1}(x) = x^2 + 25;\ y \geq 5$

c. $f^{-1}(x) = x^2 + 5;\ y \geq 25$

d. $f^{-1}(x) = x^2 + 5;\ y \geq 5$