

1. Evaluate. $\sqrt{9}$

A. -3

B. ± 3

C. 9

D. ± 9

E. 3

2. Which of these is **not** a factor of the expression $4x^4 + 7x^3 - 15x^2$?

A. x^2

B. $x + 3$

C. $4x - 5$

D. All of these are factors of the expression

E. $2x + 1$

3. To solve the equation $x^2 - 10x = 13$ using the method of completing the square, you would _____ both sides of the equation.

A. subtract 10 from

B. add 10 to

C. subtract 25 from

D. subtract 13 from

E. add 25 to

4. Suppose that k is a real number. Which description represents all values of x for which the equality $\frac{|x - k|}{x - k} = -1$ is true?

A. $x > k$

B. $x \geq k$

C. $x \leq k$

D. $x \neq k$

E. $x < k$

5. Which value is **not** in the domain of the expression $\frac{x-7}{\sqrt{(x-2)^2-2}}$?

A. -3 B. -2 C. 0 D. 4 E. 1

6. Which of these describes all restrictions on the domain of the expression $\frac{x-1}{x-3} \div \frac{x-2}{x-4}$?
All real numbers except...

A. $x \neq 4$ B. $x \neq 3, 4$ C. $x \neq 1, 2, 3, 4$
D. $x \neq 0, 1, 2, 3, 4$ E. $x \neq 2, 3, 4$

7. Combine like terms if possible: $3\sqrt{176} + 2\sqrt{275}$.

A. $9\sqrt{22}$ B. $5\sqrt{451}$ C. $5\sqrt{11}$ D. $9\sqrt{11}$ E. $22\sqrt{11}$

8. The endpoints of a diameter of a circle are located at the points $(-4, 2)$ and $(12, -10)$. Find the standard form of the equation of the circle.

A. $(x + 4)^2 + (y - 4)^2 = 20^2$

B. $(x - 4)^2 + (y + 2)^2 = 10^2$

C. $(x - 4)^2 + (y + 4)^2 = 20^2$

D. $(x - 4)^2 + (y + 2)^2 = 20^2$

E. $(x - 4)^2 + (y + 4)^2 = 10^2$

9. If $f(x) = 3x^7 + 8$ find $f^{-1}(x)$.

A. $\sqrt[7]{\frac{x}{3} - 8}$

B. $\frac{\sqrt[7]{x} - 8}{3}$

C. $\sqrt[7]{x} - \frac{8}{3}$

D. $\frac{\sqrt[7]{x - 8}}{3}$

E. $\sqrt[7]{\frac{x - 8}{3}}$

10. Multiply and choose the correct result: $(x^2 - 5x + 2)(x^2 + 3)$

A. $x^4 + 5x^3 - 5x^2 - 15x + 6$

B. $x^4 - 5x^3 + 5x^2 + 15x - 6$

C. $x^4 + 5x^3 + 5x^2 + 15x - 6$

D. $x^4 + 5x^3 + 5x^2 + 15x + 6$

E. $x^4 - 5x^3 + 5x^2 - 15x + 6$

11. Let $f(x) = x^2$. Create $g(x)$ by shifting $f(x)$ left by 7 units, up by 9 units, and stretching it vertically by a factor of 4. What is the formula for $g(x)$?

- A. $g(x) = 4x^2 + 14x + 58$
B. $g(x) = 4x^2 + 56x + 187$
C. $g(x) = 4x^2 - 56x + 205$
D. $g(x) = 4x^2 - 56x + 187$
E. $g(x) = 4x^2 + 56x + 205$
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12. Compute the average rate of change of the function $f(x) = -x^2 + 5$ on the interval $[4, 7]$

- A. 4 B. 7 C. -3 D. -33 E. -11
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13. Choose the value that is not a rational number:

- A. .1919191919... B. $\frac{4}{9}$ C. -18
D. $\sqrt{25}$ E. π
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14. A line segment has one endpoint at $(6, -4)$ and its midpoint at $(1, 3)$. Its other endpoint is at...

- A. $(-5, 9)$ B. $(-3, 11)$ C. $(-4, 12)$ D. $(-3, 13)$ E. $(-4, 10)$
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15. Use the table below to compute $g^{-1}(-3)$.

x	-3	-2	-1	0	1	2	3
$g(x)$	-7	-3	1	5	9	13	17

- A. 2 B. 1 C. 0 D. -1 E. -2
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16. In which categories does the number $.656565\dots$ fit?

P. Integers

Q. Rational Numbers

R. Irrational Numbers

S. Real Numbers

- A. P only B. P and Q only C. Q only
D. R and S only E. Q and S only
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17. Factor completely and choose the equivalent expression: $27 - (3 - x)^3$

- A. $(6 - x)(x^2 - 9x + 9)$ B. $(6 - x)(x^2 - 3x + 9)$ C. $-x(x^2 - 9x + 27)$
D. $(x - 6)(x^2 - 3x + 9)$ E. $x(x^2 - 9x + 27)$
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18. Suppose that $a > 1$, $b < -1$ and n is a positive integer. Choose the true statement.

A. $(a - b)^2 = a^2 - b^2$

B. $a^{-n} = -\frac{1}{a^n}$

C. $\frac{a + b}{a} = 1 + b$

D. $\frac{1}{ab} = \frac{1}{a}b$

E. $|b| = -b$