

- 1.** If k is a constant, what is the value of k such that the polynomial $k^2x^3 - 6kx + 9$ is divisible by $x - 1$?

Enter your answer in the box.

Use the information provided to answer Part A and Part B for question 2.

Consider the equation $\frac{4^{x^2}}{2^x} = 2$.

2. Part A

Which equation is equivalent to the equation shown?

- A. $2^{x^2} = 2$
- B. $2^{x^2-x} = 2$
- C. $2^{2x} = 2$
- D. $2^{2x^2-x} = 2$

Part B

Which values are solutions to the equation?

Select **all** that apply.

- A. -2
- B. -1
- C. $-\frac{1}{2}$
- D. $\frac{1}{2}$
- E. 1
- F. 2

3. What extraneous solution arises when the equation $\sqrt{x+3} = 2x$ is solved for x by first squaring both sides of the equation?

Enter your answer in the box.

4. Which expressions are equal to a real number?

Select **all** that apply.

A. $(-4i)^{11}$

B. $(-3i)^{12}$

C. $(2 + 3i)^2$

D. $(4 + 5i)(4 - 5i)$

E. $(6 + 8i)(8 + 6i)$

5. Given that $x > 0$, which expression is equivalent to $5\sqrt{xy} + 25\sqrt{x}$?

A. $5(xy)^{-1} + 25x^{-1}$

B. $25x^{\frac{1}{2}}(\sqrt{y} + 5)$

C. $\sqrt{x}\left(25y^{\frac{1}{2}} + 5\right)$

D. $5x^{\frac{1}{2}}\left(y^{\frac{1}{2}} + 5\right)$

6. Which equation has non-real solutions?
- A. $2x^2 + 4x - 12 = 0$
 - B. $2x^2 + 3x = 4x + 12$
 - C. $2x^2 + 4x + 12 = 0$
 - D. $2x^2 + 4x = 0$
7. Which expression is equivalent to $a^2x^2 - 2cx^2 + a^2y - 2cy$?
- A. $(x^2 - y)(a^2 - 2c)$
 - B. $(x^2 - y)(a + c)$
 - C. $(x^2 + y)(a^2 - 2c)$
 - D. $(x^2 + y)(a + c)$

Use the information provided to answer Part A and Part B for question 8.

Consider the expression $6x^3 - 5x^2y - 24xy^2 + 20y^3$.

8. Part A

Which expression is equivalent to $6x^3 - 5x^2y - 24xy^2 + 20y^3$?

A. $x^2(6x - 5y) + 4y^2(6x + 5y)$

B. $x^2(6x - 5y) + 4y^2(6x - 5y)$

C. $x^2(6x - 5y) - 4y^2(6x + 5y)$

D. $x^2(6x - 5y) - 4y^2(6x - 5y)$

Part B

Which expressions are factors of $6x^3 - 5x^2y - 24xy^2 + 20y^3$?

Select **all** that apply.

A. $x^2 + 4y^2$

B. $6x - 5y$

C. $x + 2y$

D. $6x + 5y$

E. $x - 2y$

9. Solve the equation $27^x = 9^{x-3}$ for x .

Enter your answer in the box.

10. The functions f and g are defined by $f(x) = x^2$ and $g(x) = 2x$, respectively.

Which equation is equivalent to $h(x) = \frac{f(2x)g(-2x)}{2}$?

A. $h(x) = -2x^3$

B. $h(x) = -8x^3$

C. $h(x) = x^2 - 2x$

D. $h(x) = 2x^2 + 2x$

