

Multiple-Choice

1. The fraction $\frac{x-2}{x^2+4x-21}$ is *not* defined when $x =$

- (A) 2
- (B) 7 or -3
- (C) -7 or 3
- (D) -7 or -3

2. If $\frac{a^2}{2} = 2a$, then a equals

- (A) 0 or -2
- (B) 0 or 2
- (C) 0 or -4
- (D) 0 or 4

3. If $(s-3)^2 = 0$, what is the value of $(s+3)(s+5)$?

- (A) 48
- (B) 24
- (C) 15
- (D) 0

4. If $k = 7 + \frac{8}{k}$, what is the value of $k^2 + \frac{64}{k^2}$?

- (A) 33
- (B) 49
- (C) 64
- (D) 65

$$\frac{18-3w}{w+6} = \frac{w^2}{w+6}$$

5. Which of the following represents the *sum* of all possible solutions to the equation above?

- (A) -9
- (B) -3
- (C) 3
- (D) 9

$$\text{Equation (1): } 2x^2 + 7x = 4$$

$$\text{Equation (2): } (y-1)^2 = 9$$

6. If f is the greater of the two roots of Equation (1) and g is the lesser of the two roots of Equation (2), what is the value of the product $f \times g$?

- (A) -4
- (B) -1
- (C) 2
- (D) 8

$$x^3 - 20x = x^2$$

7. If a , b , and c represent the set of all values of x that satisfy the equation above, what is the value of $(a + b + c) + (abc)$?
- (A) -1
(B) 0
(C) 1
(D) 9
8. If $\frac{x^2}{3} = x$, then $x =$
- (A) 0 or -3
(B) 3 only
(C) 0 only
(D) 0 or 3
9. By how much does the sum of the roots of the equation $(x + 1)(x - 3) = 0$ exceed the product of its roots?
- (A) 1
(B) 2
(C) 3
(D) 5
10. If $x^2 - 63x - 64 = 0$ and p and n are integers such that $p^n = x$, which of the following CANNOT be a value for p ?
- (A) -8
(B) -4
(C) -1
(D) 4
11. If $r > 0$ and $r^t = 6.25r^{t+2}$, then $r =$
- (A) $\frac{2}{5}$
(B) $\frac{4}{9}$
(C) $\frac{5}{8}$
(D) $\frac{3}{4}$

$$\frac{x}{2x-1} = \frac{2x+1}{x+2}$$

12. If m and n represent the solutions of the equation above, what is the value of $m + n$?

- (A) $-\frac{4}{3}$
 (B) $-\frac{3}{4}$
 (C) $\frac{2}{3}$
 (D) $\frac{5}{4}$

$$\frac{1}{(t-2)^2} = 6 + \frac{1}{(t-2)}$$

13. If p and q represent the solutions of the equation above, what is the value of $p \times q$?

- (A) $-\frac{3}{2}$
 (B) $\frac{7}{2}$
 (C) $\frac{9}{4}$
 (D) $\frac{15}{8}$

Grid-In

1. If $(4p + 1)^2 = 81$ and $p > 0$, what is a possible value of p ?
2. If $(x - 1)(x - 3) = -1$, what is a possible value of x ?
3. By what amount does the sum of the roots exceed the product of the roots of the equation $(x - 5)(x + 2) = 0$?

$$(3k + 14)k = 5$$

4. If r and s represent the solutions of the equation above and $r > s$, what is the value of the difference $r - s$?

$$x^4 + 16 = 10x^2$$

5. If p and q are distinct roots of the equation above and $pq > 0$, what is the value of the product pq ?

$$(2a - 5)^2 = (4 - 3a)^2$$

6. What is the sum of the roots of the equation above?