

- 1) Simplify the following polynomial operations.

$$(7n^3 + 3n - 5) - [(4n^2 + 6n - 1) + (5n^3 - 2n^2 + 4n)]$$

- A. $2n^3 + 2n^2 + 13n - 6$
B. $2n^3 - 2n^2 + 13n - 6$
C. $2n^3 - 2n^2 - 7n - 4$
D. $2n^3 + 2n^2 - 7n - 4$
E. None of the above.

- 2) Which statement(s) in the box below is(are) true?

- I The degree of the polynomial $5x^2 - 7x^3 + 8x^4 + 2$ is 4.
II After completing the multiplication, $(4x + 2)(x - 2)$ is a binomial.
III The leading term of $-7x^2 + 2x^3 - 8x^4 + x^5$ is x^5 .

- A. I, II, and III
B. I and III only
C. I and II only
D. I only
E. II and III only

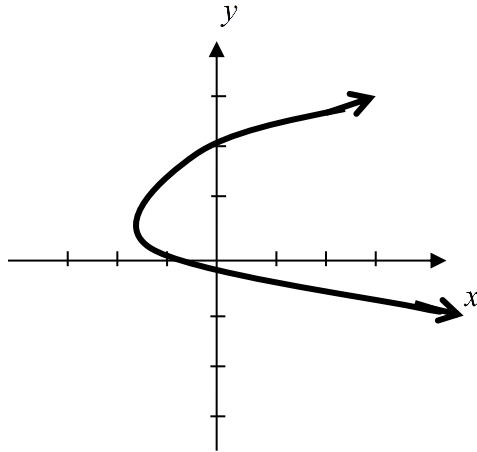
- 3) What is the domain of function g , if $g(x) = (2x + 5)^{1/2}$?

- A. $[0, \infty)$
B. $[-\frac{2}{5}, \infty)$
C. $(-\infty, -\frac{5}{2}]$
D. $(-\infty, \infty)$
E. $[-\frac{5}{2}, \infty)$

4) Which of the following does not represent a function?

A. $\{(5, 2), (-3, 2), (0, 2), (100, 2)\}$

B.

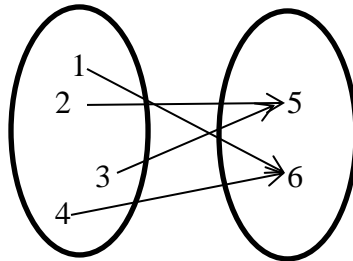


C. $y = \sqrt{x-5}$

D.

x	4	5	6	7	8
y	0	1	2	3	4

E.



5) Find the product: $(4x+5)(4x-5)(16x^2+25)$

A. $256x^4 + 800x^2 + 625$

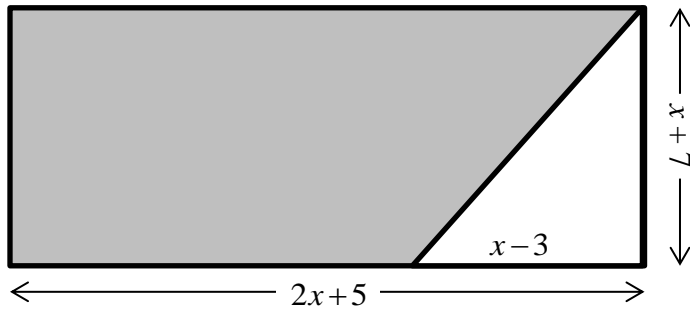
B. $256x^4 - 625$

C. $256x^4 - 400x^2 + 625$

D. $256x^4 + 625$

E. $256x^4 - 800x^2 + 625$

- 6) Find an expression for the area of the gray shaded region below.



- A. Area = $\frac{3}{2}x^2 + 17x + \frac{91}{2}$
 B. Area = $\frac{3}{2}x^2 + 21x + \frac{91}{2}$
 C. Area = $\frac{3}{2}x^2 + 17x + \frac{57}{2}$
 D. Area = $x^2 + 15x + 14$
 E. Area = $\frac{3}{2}x^2 + 21x + \frac{91}{2}$
- 7) Solve the equation: $\frac{-3}{x+4} + \frac{7}{x-4} = \frac{-5x}{x^2-16} + \frac{4}{x^2-16}$
- A. $x = -4$
 B. $x = -\frac{4}{3}$
 C. $x = -\frac{20}{9}$
 D. All real numbers, except -4 and 4
 E. No solution
- 8) Solve the equation: $\frac{x+3}{3} + \frac{x+7}{2} = 4x + \frac{1}{2}$

- A. $x = \frac{24}{19}$
 B. $x = -24$
 C. $x = \frac{21}{19}$
 D. $x = \frac{19}{24}$
 E. None of the above.

- 9) Given the function below, find $f(2a+3)$ if $a = -\frac{1}{2}$. Give answer in terms of a .

$$f(x) = \begin{cases} \frac{x+2}{2} & \text{if } x < 0 \\ x^2 + 5x & \text{if } 0 \leq x \leq 3 \\ \frac{x+3}{2x} & \text{if } x > 3 \end{cases}$$

- A. $4a^2 + 22a + 24$
 B. $4a^2 + 22a + 12$
 C. $a + 2$
 D. $4a^2 + 10a + 24$
 E. $\frac{a+3}{2a+3}$

- 10) Joyce leaves her apartment and rides her bike due south at a rate of 12 miles per hour. Her roommate, Susan, leave the apartment half an hour later and jogs due north at a rate of 6 miles per hour. How long has Joyce been riding when the girls are 45 miles apart? (A table has been provided for help.)

	Distance	Rate	Time
Joyce			
Susan			

- A. $2\frac{1}{2}$ hr.
 B. $7\frac{1}{2}$ hr.
 C. 3 hr.
 D. 6 hr.
 E. $2\frac{2}{3}$ hr.

- 11) Solve this equation and select one of its solutions.

$$3x^2 = 10 - 13x$$

- A. $x = 5$
- B. $x = -\frac{2}{3}$
- C. $x = -\frac{3}{2}$
- D. $x = \frac{3}{2}$
- E. $x = \frac{2}{3}$

- 12) Two hoses working together can fill a tank in 2 hours. The smaller hose, working alone, can fill the tank in 3 hours more time than the larger hose alone. How long would it take the larger hose alone to fill the tank?

- A. 2 hours
- B. 3 hours
- C. $3\frac{1}{2}$ hours
- D. 4 hours
- E. $2\frac{1}{2}$ hours

- 13) Which of the equations below represents a line containing the points, $P(-2, -5)$ and $Q(6, -4)$?

- A. $y = \frac{1}{8}x + \frac{19}{4}$
- B. $y = -\frac{9}{4}x - \frac{19}{2}$
- C. $y = \frac{1}{8}x + \frac{13}{4}$
- D. $y = -\frac{9}{4}x + \frac{19}{2}$
- E. $y = \frac{1}{8}x - \frac{19}{4}$

14) Find the value of the following limit, if it exists.

$$\lim_{x \rightarrow 2} \frac{2x^2 - x - 6}{x - 2}$$

- A. ∞
- B. 0
- C. 7
- D. 1
- E. The limit does not exist.

15) Find the value of the following limit, if it exists.

$$\lim_{x \rightarrow \infty} \frac{-2x - 8 + 3x^2}{2x^2 + x - 10}$$

- A. -1
- B. $\frac{10}{9}$
- C. -2
- D. $\frac{3}{2}$
- E. $\frac{4}{5}$