V. Cylinder = $\pi r^2 h$

$\pi(2)^2(7.75)$
$= 97.2$

$\pi(2)^2(8)$
$= 100.7$

33

A laboratory supply company produces graduated cylinders, each with an internal radius of 2 inches and an internal height between 7.75 inches and 8 inches. What is one possible volume, rounded to the nearest cubic inch, of a graduated cylinder produced by this company?

A) Greater than or equal to 97 and less than or equal to 101

B) Less than or equal to 97 and greater than or equal to 101

C) Greater than or equal to 70 and less than or equal to 90

D) Less than or equal to 70 and greater than or equal to 90

34

In the xy-plane, the graph of $y = 3x^2 - 14x$ intersects the graph of $y = x$ at the points $(0, 0)$ and (a, a). What is the value of a?

A) -5
B) 5
C) 7
D) 9

$3(-5)^2 - 14(-5) = 5$
$3(5)^2 - 14(5) = 5$

CONTINUE

$x \cdot 2^4 = 480$

$x = 30$

35

The line with the equation $\frac{4}{5}x + \frac{1}{3}y = 1$ is graphed in the xy-plane. What is the x-coordinate of the x-intercept of the line?

$y = 0$

A) 1.25
B) 3.5
C) 5
D) 9

$\frac{4}{5}x + \frac{1}{3}(0) = 1$

shift solve

37

Jeremy deposited x dollars in his investment account on January 1, 2001. The amount of money in the account doubled each year until Jeremy had 480 dollars in his investment account on January 1, 2005. What is the value of x?

A) 15
B) 30
C) 60
D) 120

$x = 30$

60	2001
120	2002
240	2003
480	2004
	2005

$\times 2$

36

	Masses (kilograms)					
Andrew	2.4	2.5	3.6	3.1	2.5	2.7
Maria	x	3.1	2.7	2.9	3.3	2.8

Andrew and Maria each collected six rocks, and the masses of the rocks are shown in the table above. The mean of the masses of the rocks Maria collected is 0.1 kilogram greater than the mean of the masses of the rocks Andrew collected. What is the value of x?

A) 1
B) 2.6
C) 4.8
D) 8

Maria = Andrew + 0.1

$\frac{x + 3.1 + 2.7 + 2.9 + 3.3 + 2.8}{6} = \frac{2.4 + 2.5 + \cdots + 2.7}{6} + 0.1$

shift solve

38

A school district is forming a committee to discuss plans for the construction of a new high school. Of those invited to join the committee, 15% are parents of students, 45% are teachers from the current high school, 25% are school and district administrators, and the remaining 6 individuals are students. How many more teachers were invited to join the committee than school and district administrators?

A) 2
B) 6
C) 8
D) 10

$100 - (25 + 45 + 15) = 15$

$45 - 25 = 20$

$6 \qquad 15\%$

$x \qquad 20$

$\frac{6 \times 20}{15} = 8$

CONTINUE →

Questions 1 and 2 refer to the following information.

For a point source, sound waves propagate in concentric spheres, therefore the intensity of the sound at a point A distant D from the source is given by: $I = \dfrac{P}{4\pi D^2}$ where:

I is the sound intensity

P is the power of the point source

D is the distance between the source and the point A where the intensity is to be found

1. Isolate **D**.

   A. $D = 2\sqrt{\dfrac{\pi I}{P}}$

   B. $D = \dfrac{1}{2}\sqrt{\dfrac{P}{\pi I}}$

   C. $D = \left(\dfrac{P}{4\pi I}\right)^2$

   D. $D = \sqrt{\dfrac{P}{2\pi I}}$

   $\dfrac{I}{I} = \dfrac{P}{4\pi}D^2$

   $4\pi I \cdot D^2 = P$

   $D^2 = \sqrt{\dfrac{P}{4\pi I}}$

   $\sqrt{4} = 2$

2. If the power of the source doubles (P'=2P), and the distance between the source and point A also doubles (D'=2D), the sound intensity becomes I'. What is the relationship between I' and I?

   A. I' = I
   B. I' = 4 I
   C. I' = I / 2
   D. I' = I / 4

   $I = \dfrac{P}{4\pi D^2}$

   $= \dfrac{2}{(2)^2} = \dfrac{2}{4} = \dfrac{1}{2}$

3. The weekly salary **S** of Samantha is given by S = 7*h*d+ 75 where h is the number of hours she works every day and d is the number of working days each week. If Samantha is to be promoted with a salary increase, which of the following terms must change?

   A. 7
   B. h
   C. d
   D. None of the above

4. In the xy-plane, the equation of the line (d) passing through A(-1,4) and perpendicular to line 3x-2y = 5 is:

   A. $y = \dfrac{3}{2}x + \dfrac{11}{2}$

   B. $y = -\dfrac{3}{2}x + \dfrac{5}{2}$

   C. $y = -\dfrac{2}{3}x + \dfrac{14}{3}$

   D. $y = -\dfrac{2}{3}x + \dfrac{10}{3}$

   $-2y = +3x + 5$
   $\div 2 \qquad \div -2$

   $m = \dfrac{3}{2} \longrightarrow -\dfrac{2}{3}$

   $= -\dfrac{2}{3}(-1) + \dfrac{14}{3}$

   $\dfrac{2}{3} + \dfrac{14}{3} = \dfrac{16}{3}$

   $y = mx + b$

   slope → y-int

   2 points $\dfrac{y-y}{x-x}$

   Graph $\dfrac{rise}{run}$

   Eqn: ng. beside x

   $+ve$
   $-ve$
   zero
   undefined

5. A researcher selected a random sample of 25 different brands of bottled water and measured the corresponding PH. He found out that the mean PH of the sample was 7.3 with an associated margin of error of 0.25. Which of the following is the best interpretation of the researcher's findings?

~~A.~~ Most water bottles in the market have a PH between 7.05 and 7.55

~~B.~~ All water bottles in the market have a PH between 7.05 and 7.55

C. Any PH between 7.05 and 7.55 is a plausible value for the mean PH of the water bottles in the sample

D. Any PH between 7.05 and 7.55 is a plausible value for the mean PH of the water bottles in the market

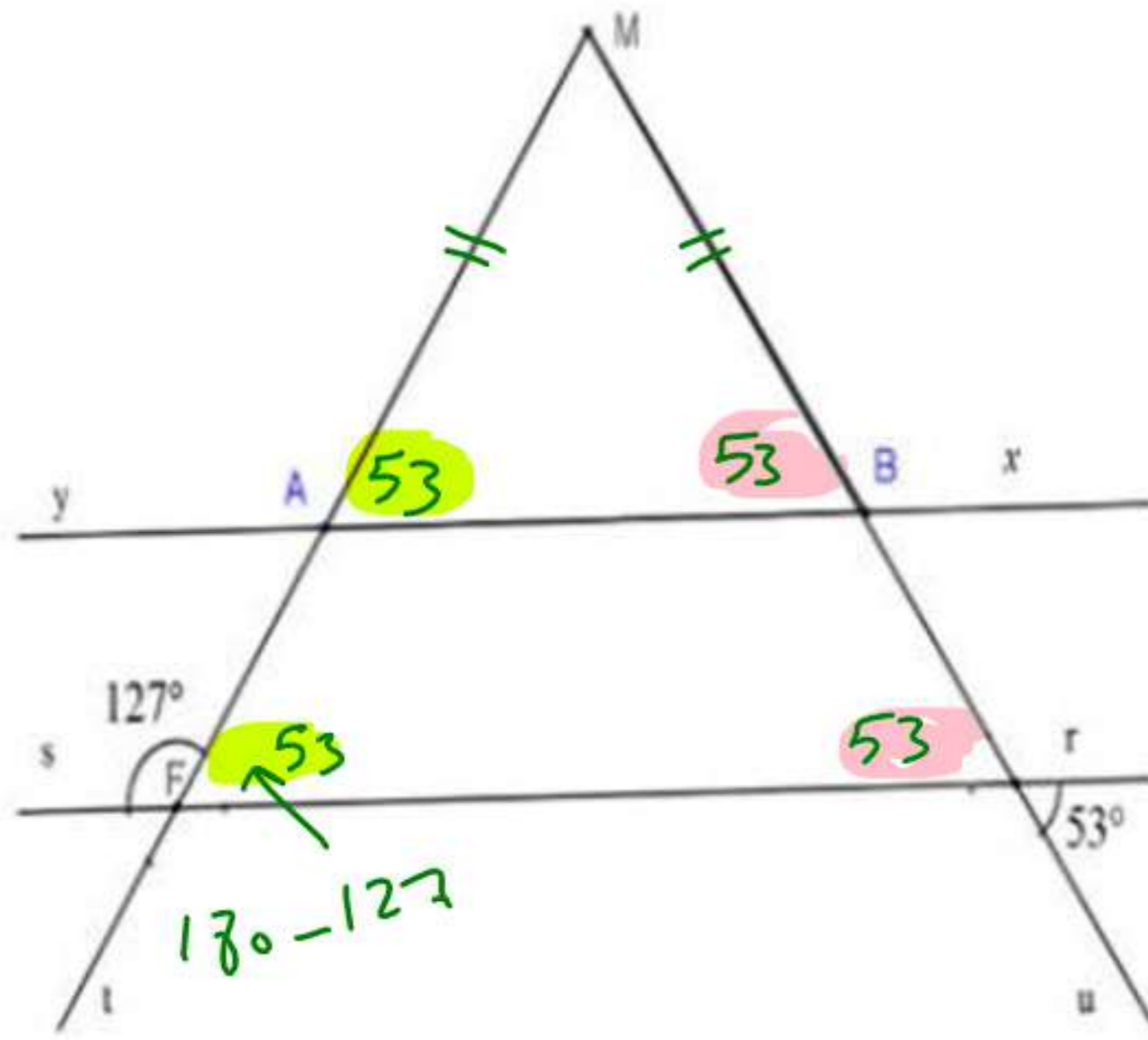**6.** If $h(x) = -x^2 + 3x - 2$ and $k(x) = -2x - 5$, what is the value of $h(k(-2))$?

A. -6
B. -4
C. 0
D. 2

$K(-2) = -2(-2) - 5$
$= 4 - 5$
$= -1$
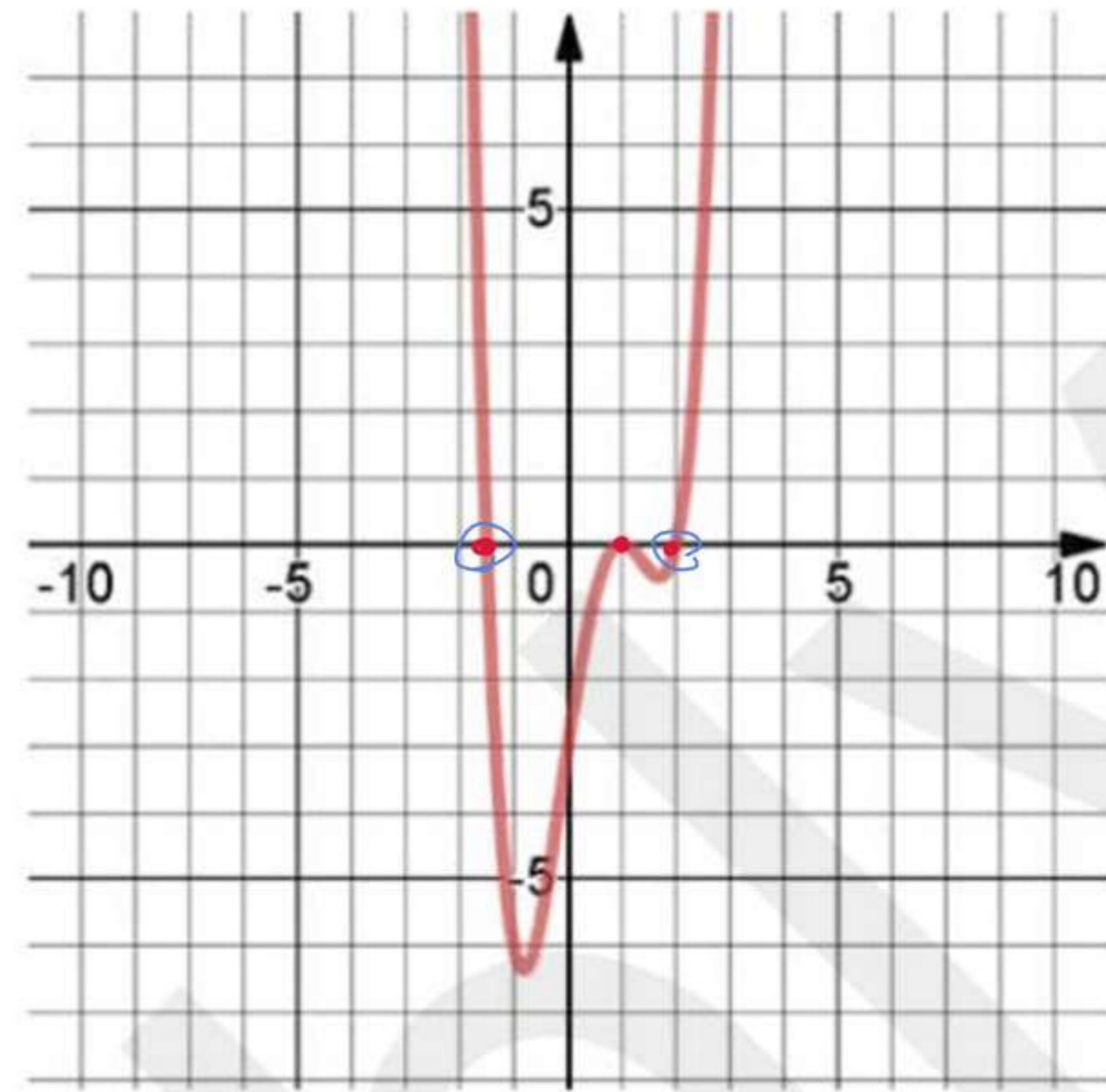
$h(-1) = -(-1)^2 + 3(-1) - 2$
$= -1 - 3 - 2$
$= -6$

7. The graph above depicts a function $f(x)$. How many solutions does the equation $f(x) = 0$ admit?

$y = 0$

A. 1
B. 2
C. 3
D. 4

8. Which of the following angles have the same value of $\sin 32°$?

A. $\sin(-32°)$ $a + b = 90 \longleftrightarrow \sin a = \cos b$
B. $\sin 58°$
C. $\cos(-32°)$
D. $\cos 58°$ $\cos(90 - 32)$

9. Knowing that lines (xy) and (rs) are parallel, what is the type of triangle ABM? (Figure is not drawn to scale)

A. Scalene
B. Isosceles
C. Equilateral
D. Right isosceles

10. A rental car company charges its clients by the number of **days d** the car is rented. If the bill **b** of a client is given by the equation **b = 5d+20**, what is the best interpretation of the term **5?**

A. The rental cost of the car per day
B. The fixed cost of renting a car, no matter how many days it is rented
C. The average number of days the car is rented
D. The fees of renting a car for 7 days
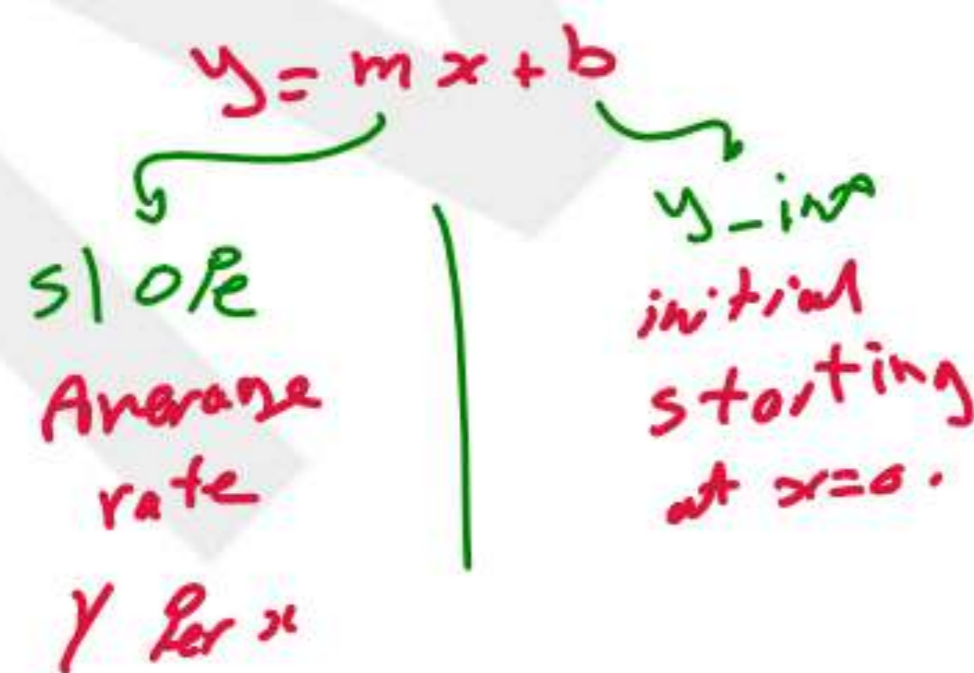
The table below summarizes the grades out of 10 obtained by 4 players in a competition over a total of 5 rounds.

	Diego	Mark	Tyler	Toni
Round 1	7	3	8	10
Round 2	5	10	7	4
Round 3	8	9	6	9
Round 4	9	5	7	10
Round 5	4	8	8	7
Standard deviation	1.85	2.61	0.75	2.28

11. The winner is the player with the highest average. Who won the competition?

A. Diego
B. Toni
C. Tyler
D. Mark

12. Which player was the most consistent in terms of his grades?

A. Mark
B. Diego
C. Toni
D. Tyler

13. What is the resulting coefficient of x when (-2x+3) is multiplied by (-3x-2?)

A. -9
B. -5
C. 5
D. 6

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

$4x - 9x$

$-5x$

$$\frac{-6(2)^2+5(2)+2}{2(2)+1} = \frac{-24+12}{5}$$

$x=2$

$= \frac{-12}{5}$

$$\frac{-6x^2 + 5x + 2}{2x + 1}$$

14. Which of the following is equivalent to the above expression?

$-3(2)+4-\frac{2}{2(2)+1}$

①**A.** $-3x + 4 - \frac{2}{2x+1}$ ✔

B. $-3x + 4 + \frac{2}{2x+1}$

$\frac{5 \cdot -2}{5 \cdot 1} - \frac{2}{5}$

C. $-3x - \frac{2}{2x+1}$

D. $-3x + 4$

$\frac{-16}{5} - \frac{2}{5} = \frac{-12}{5}$

15. If m and k are positive numbers, which of the following expressions is equivalent to $(16k^{12}m^4)^{\frac{1}{4}}$?

A. $4k^3m$

B. $2k^3$

C. $4k^3m^2$

①**D.** $2k^3m$

$16^{\frac{1}{4}}$ $k^{12 \cdot \frac{1}{4}}$ $m^{4 \cdot \frac{1}{4}}$

$\sqrt[4]{16}$ $k^3 m$

2173
Page

$\sqrt{16} = 4$