1. A circle has <u>diameter</u> AB with A = (2,–3) and B = (7,9).
    The <u>radius</u> of the circle measures:

A. 13

B. 6.5

C. $\sqrt{117}$

D. 26

E. $\dfrac{\sqrt{61}}{2}$

2. The center and radius of the given circle are:
$$x^2 + y^2 + 4x - 6y = 36$$

A. C=(2,–3) r = 7

B. C=(2,–3) r = 49

C. C= (2,–3) r = 6

D. C = (–2,3) r = 7

E. C = (–2,3) r = 6

3. An equation of the line through (–5,0) and (0, –4) is:

A. $2x + 3y + 10 = 0$

B. $3x + 2y + 15 = 0$

C. $2x - 3y + 10 = 0$

D. $2x + 3y + 5 = 0$

E. $2x + 3y + 15 = 0$

4. The *x*-coordinate of the vertex of the given parabola is:
$$y = 2x^2 + 12x + 19$$

A. 3

B. 6

C. −12

D. 1

E. −3

5. y varies jointly as w and $\sqrt{x}$. If $y = 66$ when $w = 4$ and $x = 121$,

find the explicit formula for the dependent variable.
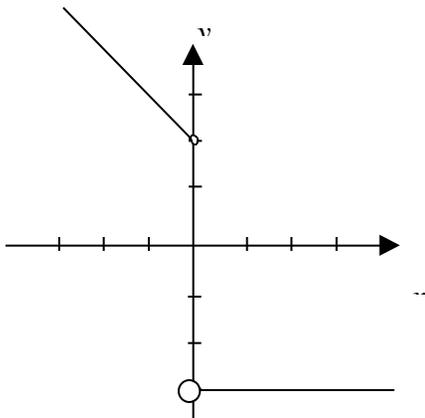
A. $y = \dfrac{3w}{2\sqrt{x}}$

B. $y = \dfrac{3}{22} w\sqrt{x}$

C. $y = \dfrac{22}{5} \left(w + \sqrt{x} \right)$

D. $y = \dfrac{3}{2} w\sqrt{x}$

E. $y = \dfrac{363w}{2\sqrt{x}}$

6. The function for the given graph is:

A. $f(x) = \begin{cases} 2 - x & if \ x \ 0 \\ -3 & if \ x > 0 \end{cases}$

B. $f(x) = \begin{cases} -2x + 2 & if \ x \ 0 \\ x - 3 & if \ x > 0 \end{cases}$

C. $f(x) = \begin{cases} 2x & if \ x \quad 0 \\ -3 & if \quad x > 0 \end{cases}$

D. $f(x) = \begin{cases} 2 + x & if \ x \quad 0 \\ -3 & if \ x > 0 \end{cases}$

E. None of these.

7. If $f(x) = 4 - x$ and $g(x) = x^2 - 3x - 4$, find $(g/f)(-5)$.

A. 4

B. –6

C. $\dfrac{1}{4}$

D. 50

E. –36

8. If $f(x) = x^2 - 5$ and $g(x) = 3x + 1$, find $(f \circ g)(x)$.

A. $3x^2 - 14$

B. $9x^2 + 6x - 5$

C. $9x^2 + 6x - 4$

D. $3x^3 + x^2 - 15x - 5$

E. $9x^2 - 4$

9. Simplify: $\sqrt{32a^5b^7}\sqrt{2a^2bc^3}$

    A. $8a^5b^3c\sqrt{bc}$

    B. $8a^3b^4c\sqrt{ac}$

    C. $8a^6b^8c^2\sqrt{ac}$

    D. $4a^3b^4c\sqrt{2ac}$

    E. None of these.

10. Simplify, leaving your answer without negative exponents.

$\left(x^0y^{-3/2}\right)^2\left(5x^4y^{1/2}\right)^3$

    A. $15x^{12}y^{1/2}$

    B. $\dfrac{15x^{12}}{y^{3/2}}$

    C. $125x^{12}y^{1/2}$

    D. $\dfrac{125}{y^{9/2}}$

    E. None of these.

11. A boat purchased in 1993 for $18,000 depreciated linearly
and is worth $6,750 in 2002. The formula for V, its value
t years after purchase, is:

    A. $V(t) = -1125t + 18000$

B. $V(t) = -\dfrac{1}{1250}t + 18000$

C. $V(t) = -1250t + 18000$

D. $V(t) = 1250t - 18000$

E. $V(t) = 1125t - 18000$

12. A motorboat leaves an island traveling east at a rate of 7 mph.
    Another boat leaves the same island at the same time traveling
    south at a rate of 9 mph. The distance between the boats in terms
    of t, the number of hours after they left, is:

A. $d = t\sqrt{130}$

B. $d = 16t^2$

C. $d = t\sqrt{32}$

D. $d = 4t$

E. None of these.

13. The fish population in Silver Lake decreases at a rate of 7%
    per year because of pollution. If the number of fish was
    estimated at 120,000 in 1995, what will the population
    be in 2014?

A. more than 0, less than 10,000

B. more than 10,000, less than 25,000

C. more than 25,000, less than 50,000

D. more than 50,000, less than 100,000

E. more than 100,000

14. Write the following as a single logarithm:

$4\log(x+2) - 2\log x + 3\log(x-1)$

A. $\log(5x+5)$

B. $\log\dfrac{(x+2)^4}{x^2(x-1)^3}$

C. $\log\dfrac{4(x+2)\ 3(x-1)}{2x}$

D. $\log\dfrac{(x+2)^4(x-1)^3}{x^2}$

E. None of these.