1. Find the midpoint of segment of *AB*, where $A(-4,1)$ and $B(1,5)$.

A. $(-3,6)$

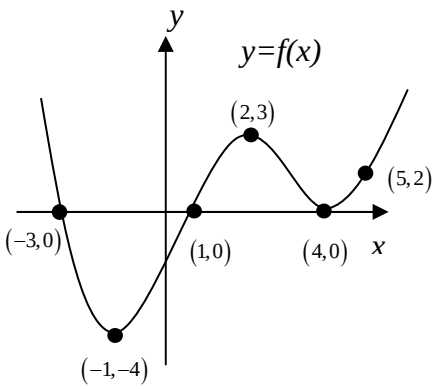
B. $\left(-\frac{3}{2},4\right)$

C. $(-1,3)$

D. $\left(-\frac{5}{2},2\right)$

E. None of the above.

Given below is the graph of a function, $y = f(x)$. Use this graph to answer questions #2 and #3:



2. Find $f(2)$.

A. $f(2)=3$

B. $f(2)=5$

C. $f(2)=0$

D. $f(2)=1$

E. None of the above.

3. Find the interval(s) for which the function is increasing.

A. $(-\infty,-3]\cup[1,\infty)$

B. $(-\infty,-1]\cup[2,4]$

C. $[-1,2]\cup[4,\infty)$

D. $[-3,1]$

E. $(-\infty,-3]\cup[2,\infty)$

4. Multiply and express the following in the form $a+bi$, where *a* and *b* are real numbers.

$$i(2-3i)^2$$

A. $6-5i$

B. $12+13i$

C. $-9+4i$

D. $12-5i$

E. None of the above.

5. Solve for *x*. Simplify your solution(s).

$$x^2+6x+41=0$$

A. $x=-3\pm\sqrt{5}\,i$

B. $x=-3\pm4\sqrt{2}\,i$

C. $x=-6\pm\sqrt{5}\,i$

D. $x=-3\pm8\sqrt{2}\,i$

E. None of the above

6. Solve the absolute value inequality given below. Express your answer in interval notation.

$$|4x+3|\geq 9$$

A. $(-\infty,-3]\cup\left[\frac{3}{2},\infty\right)$

B. $\left[-3,\frac{3}{2}\right]$

C. $\left(-\infty,-\frac{3}{2}\right]\cup[3,\infty)$

D. $\left[\frac{3}{2},\infty\right)$

E. None of the above.

7. Solve for x. Choose the answer that best describes the solution(s).

$$\sqrt{4x+1} = 5 - x$$

A. There is one solution. It is negative.

B. There are two solutions. Both are positive.

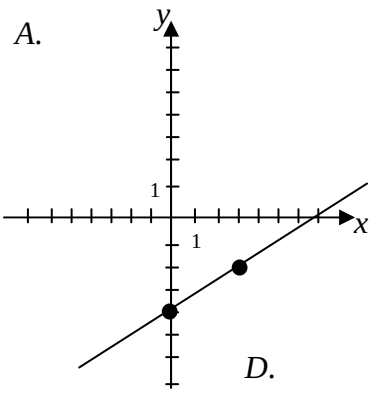
C. There is one solution. It is positive.

D. There are two solutions. One is positive and one is negative.

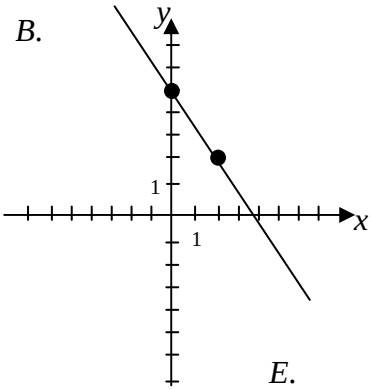
E. There is no solution for x.

8. Choose the correct graph of $3x - 2y = 8$.

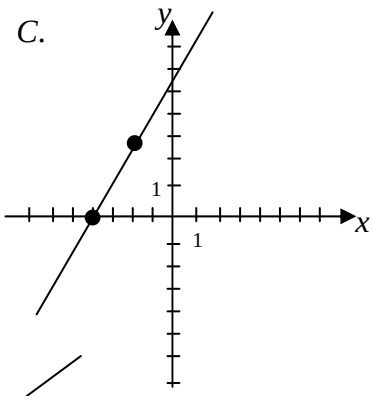
A.



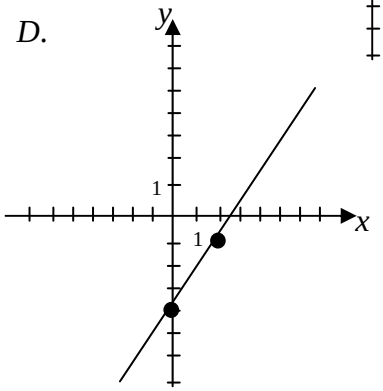
B.



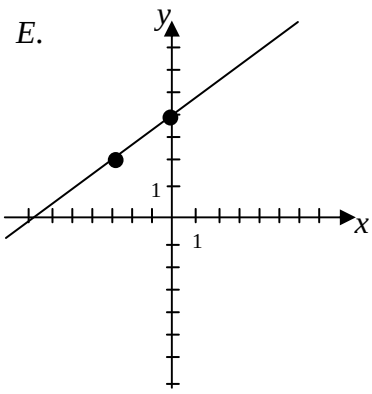
C.



D.



E.



9. Find the slope of the perpendicular bisector of segment AB, where $A(3,-1)$ and $B(-2,6)$.

A. $\frac{5}{7}$

B. $\frac{1}{5}$

C. $\frac{7}{5}$

D. 5

E. Cannot be determined.

10. Find the equation of the circle with center $C(2,-3)$ and passing through the point $P(6,-4)$.

A. $(x+2)^2+(y-3)^2=17$

B. $(x-2)^2+(y+3)^2=17$

C. $(x-2)^2+(y+3)^2=113$

D. $(x+2)^2+(y-3)^2=113$

E. None of the above.

11. Find the domain of $f(x)=\dfrac{\sqrt{2x+6}}{x^2+3x-10}$. Express your answer in interval notation.

A. $[-3,\infty)$

B. $[\text{-}5,2)\cup(2,\infty)$

C. $(-\infty,-5)\cup(-5,-3]$

D. $(-\infty,-5)\cup(-5,2)\cup(2,\infty)$

E. $[-3,2)\cup(2,\infty)$

12. The point $P(5,-3)$ is on the graph of a basic function, $y=f(x)$. Find the corresponding point on the graph of $y=4f(x-1)$.

A. $(20,-2)$

B. $(4,-12)$

C. $\left(6,-\dfrac{3}{4}\right)$

D. $(6,-12)$

E. $\left(4,-\dfrac{3}{4}\right)$

13. A square vegetable garden is to be tilled and enclosed with a fence. The fence will cost \$10 per foot and the cost of preparing the soil is \$2 per square foot. Find the length of one side of the garden if the total cost is to be \$600.

A. 14 feet

B. 12 feet

C. 10 feet

D. 8 feet

E. None of the above

14. Jake borrowed \$1800 on an interest-free loan from his parents. After 8 months, he owed \$840. Assume that the amount owed, *A*, is linearly related to the number of months, *t*, since the money was borrowed. Express *A* in terms of *t*.

A. $A = -\frac{1}{120}t + 15$

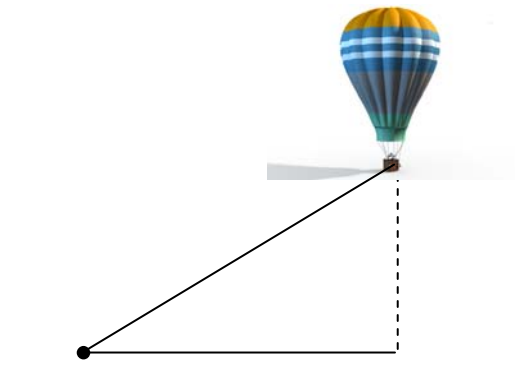
B. $A = -120t + 1800$

C. $A = -120t + 15$

D. $A = -\frac{1}{120}t + 1800$

E. None of the above.

15. A balloon is released and rises vertically at a rate of 3 m/sec. A person is standing 50 meters from a point on the ground directly below the balloon (see the figure). If *x* represents the number of seconds since the balloon was released, express the distance, *d*, between the balloon and the person as a function of *x*. Simplify the function.



A. $d(x) = \sqrt{2509x^2}$

B. $d(x) = \sqrt{9x^2 - 2500}$

C. $d(x) = \sqrt{3x + 50}$

D. $d(x) = \sqrt{3x - 50}$

E. $d(x) = \sqrt{9x^2 + 2500}$