1) Solve this equation. What is the solution set?

$$\frac{a+3}{6}+\frac{a+1}{2}=a$$

A $\{-2\}$

B $\{1\}$

C $\left\{\frac{1}{3}\right\}$

D $\left\{-\frac{20}{7}\right\}$

E $\{3\}$

2) When Liam got his car repaired after an accident, he was charged \$569 for parts and the remaining part of the bill was mechanic's labor. If the total bill was \$1025 and labor was \$48 per hour, how many hours did the mechanic work on his car?

A 8.5 *hr*.

B 9.75 *hr*.

C 8.75 *hr*.

D 10.25 *hr*.

E None of the above.

3) A chemist needs 2 liters of a solution that is 35% hydrochloric acid. She has 20% and 60% hydrochloric acid solutions available. If x represents the amount of 20% solution she uses, which equation could be used to solve for x?

A $0.2x+0.6(2-x)=0.35(2)$

B $0.2x+0.6x=0.35(2)$

C $0.2x+0.6(2-x)=2$

D $0.2x+0.6(x-2)=0.35(2)$

E $0.2x+0.6(2)=0.35x$

4) Subtract: $\left(-2+\sqrt{-25}\right)-\left(-6-\sqrt{-49}\right)$

A $4+12i$
B $-8+12i$
C $4-12i$
D $-8-2i$
E $4+2i$

5) Multiply: $\left(12-10i\right)\left(-4+\frac{1}{2}i\right)$

A $-43-46i$
B $-48-51i$
C $-53+46i$
D $-43+46i$
E None of the above.

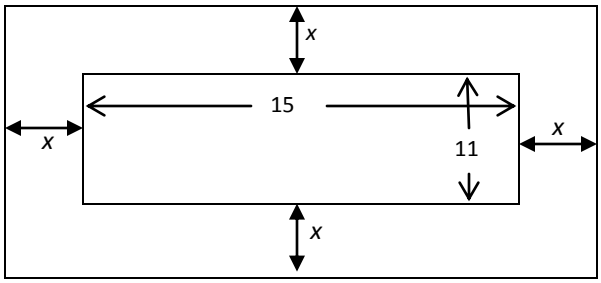
6) **One** of the solutions of the equation below can be described by which of the following?

$$\frac{1}{x}+\frac{1}{3x-2}=2$$

A It is greater than $\frac{1}{2}$, but less than 1.
B It is at least 1, but less than $\frac{3}{2}$.
C It is at least $\frac{3}{2}$, but less than 2.
D It is at least 2, but less than $\frac{5}{2}$.
E It is $\frac{5}{2}$ or greater.

7) A rectangular garden measures 15 feet by 11 feet and is surrounded by a walkway of uniform width as shown. If the area of the garden *plus* the walkway is 285 square feet and ***x* represents the width of the walkway**, which **simplified** equation could be used to find the width of the walkway?

A $x^2 + 13x - 30 = 0$
B $x^2 + 26x - 120 = 0$
C $x^2 - 13x - 30 = 0$
D $x^2 + 13x + 30 = 0$
E $x^2 - 26x + 120 = 0$



8) 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?

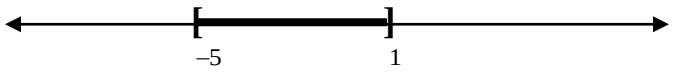
A 2 hours
B 2 ½ hours
C 3 ½ hours
D 4 hours
E 3 hours

9) Solve the equation. Select the correct statement. $\sqrt{42 - 2x} = x + 3$

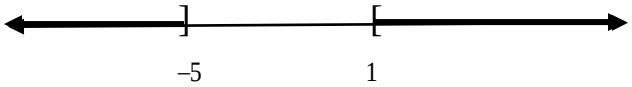
A There are two solutions, both positive.
B There are two solutions, one positive and the other negative.
C There are two solutions, both negative.
D There is one positive solution.
E There is one negative solution.

10) Which number line correctly illustrates the solution of $\left|\frac{x+2}{3}\right| \le 1$?

A



B



C

D

E None of the above.

11) Which point (*x*, y) would be a distance of 5 units from the point $(-2,5)$?

A $(-1,1)$
B $(-1,-1)$
C $(1,-1)$
D $(2,2)$
E $(-2,2)$

12) If $f(x)=\frac{2(x+1)}{x-1}$, find and simplify $f(x-1)$

A $f(x-1)=\frac{2x}{x-1}$
B $f(x-1)=\frac{2x+1}{x-2}$
C $f(x-1)=\frac{2x+2}{x-2}$
D $f(x-1)=\frac{2x}{x-2}$
E $f(x-1)=2x+2$

13) Given the piece-wise function $f(x)=\begin{cases}3x-1 & \text{if } x<1\\ \dfrac{x+2}{3} & \text{if } x\geq 1\end{cases}$, evaluate $f(1)$ and $f(4)$.

A $f(1)=2,\quad f(4)=2$

B $f(1)=2,\quad f(4)=\frac{10}{3}$

C $f(1)=1,\quad f(4)=\frac{10}{3}$

D $f(1)=1,\quad f(4)=2$

E $f(1)=\frac{7}{3},\quad f(4)=2$

14) Solve the equation. $a^2+4a+8=0$

A $a=-2+4\sqrt{3},-2-4\sqrt{3}$

B $a=-4+2i,-4-2i$

C $a=-2+2i,-2-2i$

D $a=-2+2\sqrt{3},-2-2\sqrt{3}$

E $a=-4+i,-4-i$

15) Solve: $(x-8)^{3/2}=64$

A $x=24$

B $x=4$

C $x=512$

D $x=16$

E $x=64$