1)   Subtract these polynomials: $(3a^3 - 4a + 2) - (7a^3 - a^2 + 2a - 8)$

     A. $-4a^3 - a^2 - 6a + 10$

     B. $-4a^3 + a^2 + 2a + 10$

     C. $-4a^3 - a^2 - 2a - 6$

     D. $-4a^3 + a^2 - 6a + 10$

     E.   None of the above.

2)   What is the domain of the function f written below?

$$f(x) = \sqrt{10 - 12x}$$

     A. $\left(-\infty, \frac{5}{6}\right]$

     B. $\left[\frac{6}{5}, \infty\right)$

     C. $\left[\frac{5}{6}, \infty\right)$

     D. $(-\infty, \infty)$

     E. $\left(-\infty, -\frac{5}{6}\right]$

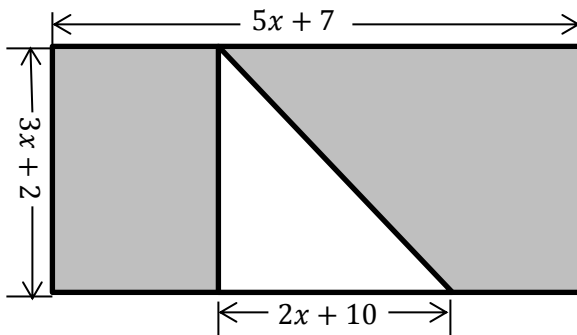3)   If $g(x) = \dfrac{2x - 3}{x + 5}$, find and simplify $g(2a + 3)$.

     A. $\dfrac{2a + 3}{a + 8}$

     B. $\dfrac{4a + 3}{2a + 8}$

     C. $\dfrac{4a + 9}{2a + 8}$

     D. $\dfrac{4a}{2a + 8}$

     E. $\dfrac{2a}{a + 8}$

4)   Which statement(s) is(are) true?

I	$(3x+1)(x^2 - x + 3) = 3x^3 - 2x^2 + 8x + 3$
II	$(4a+9)^2 = 16a^2 + 81$
III	$(10 - 4r)(10 + 4r) = 100 - 16r^2$

         A.   I and III only

         B.   I and II only

         C.   III only

         D.   II and III only

         E.   I, II, and III

5)   Find a polynomial expression to represent the area of the gray shaded region below.

         A. $Area = 9x^2 - 3x - 6$

         B. $Area = 12x^2 + 48x + 24$

         C. $Area = 9x^2 + 14x + 4$

         D. $Area = 12x^2 + 14x + 4$

         E. $Area = 12x^2 + 48x + 4$

The figure shows a rectangle with top width $5x + 7$, left height $3x + 2$, and a bottom inner segment $2x + 10$.

6)   Solve the following equation.

$$\frac{4n+2}{3}+\frac{3}{4}=\frac{n-2}{2}+\frac{7}{12}$$

A. $n=-\dfrac{5}{11}$

B. $n=-\dfrac{8}{5}$

C. $n=-\dfrac{11}{5}$

D. $n=-\dfrac{22}{5}$

E. $n=-\dfrac{5}{22}$

7)   Solve the following equation. $\dfrac{3}{2x-2}+\dfrac{1}{2}=\dfrac{2}{x-1}$

Which statement describes the solution?

A.   The solution is zero.

B.   The solution is less than -2.

C.   The solution is at least -2, but less than 1.

D.   The solution is at least 1, but less than $2\frac{1}{2}$.

E.   The solution is greater than $2\frac{1}{2}$.

8)   Jennifer deposited $800 in an account that pays a rate of 3½ % annually. She then deposited some other money in another account that pays a rate of 4% annually. If she earned a total of $29.65 interest in one year from both accounts, which equation could be used to find the amount of money Jennifer invested in the second (4% interest rate) account? Let m represent the amount invested in the second (4% interest) account.

> A. $0.035(800 - m) + 0.04m = 29.65$
>
> B. $0.35(800) + 0.4m = 29.65$
>
> C. $0.035m + 0.4(800) = 29.65$
>
> D. $0.35(85.85) + 0.4m = 800$
>
> E. $0.035(800) + 0.04m = 29.65$

9)   How much **pure** alcohol should be added to 7 Liters of 10% alcohol to get a solution that is 30% alcohol?

> A.   1 Liter
>
> B. $1\frac{1}{2}$ Liters
>
> C. $2\frac{1}{2}$ Liters
>
> D. $3\frac{1}{2}$ Liters
>
> E.   2 Liters

10)   Solve the equation $5x^2 + 7x + 2 = 0$. Which statement describes **one or both of the solutions**?

> A.   One solution is less than -5.
> B.   One solution is greater than 5.
> C.   One solution is between 0 and 5.
> D.   Both solutions are between -2 and 0.
> E.   Both solutions are between -5 and -2.

11)   Andrew and Kent both work for Joe. Andrew can complete a typical job 2 hours faster than
         Kent can complete a typical job. If both work together, they complete a typical job in 5 hours.
         How long would it take **Andrew alone** to complete a typical job? Round Andrew's time to the
         nearest tenth of an hour. Hint: You will have to use the quadratic formula.

         A.   9.1 hours

         B.   8.5 hours

         C.   11.1 hours

         D.   10.8 hours

         E.   12.8 hours

12)   Katie leaves her apartment and rides her bike south at a rate of 12 mph. Her roommate, Megan,
         starts **half an hour later** from the apartment and jogs north at a rate of 6 mph. How long has
         Katie been riding her bike when the girls are 45 miles apart?

	Distance	Rate	Time
Katie			
Megan			

         A $2\frac{1}{2}$ *hr.*

         B $5\frac{1}{2}$ *hr.*

         C   3 *hr.*

         D   4 *hr.*

         E $2\frac{2}{3}$ *hr.*

13)   An algebra student has an **average** of 70% on five exams. Her first 4 exams were 75%, 79%, 64%, and 71%. Which statement describes her percent score for the fifth exam?

> A.   Her 5th exam score was greater than 85%
> B.   Her 5th exam score was between 70% and 76%.
> C.   Her 5th exam score was between 80% and 85%.
> D.   Her 5th exam score was less than 70%.
> E.   Her 5th exam score was between 76% and 80%.

14)   Solve the equation below. Select **one** of the solutions.
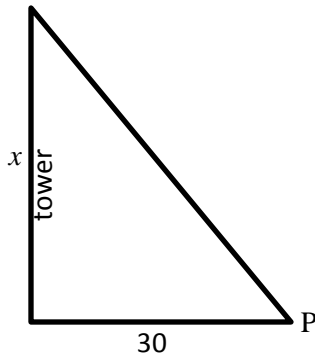
$$6x^2 - 11x - 10 = 0$$

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

15)   Solve the equation below. Write the solution set.

$$x(2x - 1) = 21$$

> A. $\left\{ -\dfrac{7}{2}, 3 \right\}$
>
> B. $\left\{ -7, \dfrac{3}{2} \right\}$
>
> C. $\left\{ -\dfrac{3}{2}, 7 \right\}$
>
> D. $\left\{ -3, \dfrac{7}{2} \right\}$
>
> E.   None of the above.

16) At a point P, 30 meters from the base of a tower, the distance to the top of the tower is 2 meters more than twice the height of the tower. If x represents the height of the tower, which **simplified** equation could be used to solve for x?

A. $3x^2 + 8x - 896 = 0$

B. $3x^2 + 4x - 896 = 0$

C. $3x^2 + 8x - 904 = 0$

D. $3x^2 - 4x - 904 = 0$

E. $3x^2 - 8x + 904 = 0$

17) Find the equation in slope-intercept form for the line passing through the points $(3, -2)$ and $(5, 1)$.

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

B. $y = -\dfrac{1}{2}x - \dfrac{1}{2}$

C. $y = \dfrac{2}{3}x - 4$

D. $y = \dfrac{3}{2}x - \dfrac{13}{2}$

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