1. Subtract.

$$8x^6 - x^3$$
$$\underline{3x^6 + 8x^3}$$

Choose the correct difference below.

- A. $5x^6 - 9x^3$
- B. $11x^6 + 7x^3$
- C. $5x^6 - 7x^3$
- D. $5x^6 + 7x^3$

2. Subtract.

$$2m^3 - 5m^2 + 10m + 2$$
$$\underline{- \quad -13m^3 + 10m^2 - 4m - 6}$$

The difference is _____ .
(Simplify your answer.)

3. Perform the indicated operations.

$$\left(7x^2 - 7x - 57\right) + \left(2x^2 + 9x\right)$$

$\left(7x^2 - 7x - 57\right) + \left(2x^2 + 9x\right) =$ _____
(Simplify your answer.)

4. Factor.
$$9y^2 + 3y$$

$9y^2 + 3y =$ _____
(Factor completely.)

5. Factor.

$$4s^4t^2 - 8s^3t^3$$

$4s^4t^2 - 8s^3t^3 =$ _____
(Factor completely.)

6. Complete the factoring.

$$x^2 + 9x - 36$$

$x^2 + 9x - 36 = (x - 3)($ _____ $)$

7. Write the rational expression in lowest terms.

$$\frac{y^2 - 12y + 32}{y^2 + 3y - 28}$$

$\dfrac{y^2 - 12y + 32}{y^2 + 3y - 28} =$ _____
(Simplify your answer.)

8. Add. Express your answer in lowest terms.

$$\frac{x+3}{5x} + \frac{4x+8}{2x}$$

Choose the correct sum.

- ○ **A.** $\dfrac{13x+31}{10x}$
- ○ **B.** $\dfrac{22x+46}{10x}$
- ○ **C.** $\dfrac{11x+23}{5x}$
- ○ **D.** $\dfrac{5x+11}{7x}$

---

9. Add as indicated. Express your answer in lowest terms.

$$\frac{3+3k}{4} + \frac{1+k}{8}$$

$$\frac{3+3k}{4} + \frac{1+k}{8} = \underline{\qquad\qquad}$$

---

10. Simplify.

$$\sqrt{50}$$

Select the correct choice below and fill in any answer boxes within your choice.

- ○ **A.** $\sqrt{50} =$ [ ]
  (Type an exact answer, using radicals as needed.)
- ○ **B.** The radical cannot be simplified.

---

11. Simplify the following radical.

$$-\sqrt{1500}$$

Select the correct choice below and fill in any answer boxes within your choice.

- ○ **A.** The radical cannot be simplified.
- ○ **B.** $-\sqrt{1500} =$ [ ]
  (Type an exact answer, using radicals as needed.)

---

12. Multiply and simplify by factoring.

$$5\sqrt{14} \cdot 7\sqrt{10}$$

$5\sqrt{14} \cdot 7\sqrt{10} = \underline{\qquad\qquad}$
(Type an exact answer, using radicals as needed.)

---

13. Solve.

$$x^2 - 19x + 90 = 0$$

Select the correct choice below and fill in any answer boxes within your choice.

- ○ **A.** The solutions are $x =$ [ ].
  (Use a comma to separate answers as needed.)
- ○ **B.** There is no real number solution.

14. Solve by completing the square. $2x^2 + 2x + 16 = 0$	Select the correct choice below and fill in any answer boxes within your choice. ○ **A.** $x =$ [____] (Type an integer or a simplified fraction. Use a comma to separate answers as needed.) ○ **B.** There are no real solutions.
15. Solve by completing the square. $x^2 - 4x = -3$	Select the correct choice below and, if necessary, fill in the answer box to complete your choice. ○ **A.** The solutions are $x =$ [____] . (Simplify your answers. Type an integer or a fraction. Use a comma to separate answers as needed.) ○ **B.** There is no real solution.

1. A. $5x^6 - 9x^3$

___

2. $15m^3 - 15m^2 + 14m + 8$

___

3. $9x^2 + 2x - 57$

___

4. $3y(3y + 1)$

___

5. $4s^3t^2(s - 2t)$

___

6. $x + 12$

___

7. $\dfrac{y - 8}{y + 7}$

___

8. C. $\dfrac{11x + 23}{5x}$

___

9. $\dfrac{7(1 + k)}{8}$

___

10. A. $\sqrt{50} = $ __**$5\sqrt{2}$**__ (Type an exact answer, using radicals as needed.)

___

11. B. $-\sqrt{1500} = $ __**$-10\sqrt{15}$**__ (Type an exact answer, using radicals as needed.)

___

12. $70\sqrt{35}$

___

13. A. The solutions are x = __**9,10**__ . (Use a comma to separate answers as needed.)

___

14. B. There are no real solutions.

___

15. A. The solutions are x = __**1,3**__ .
   (Simplify your answers. Type an integer or a fraction. Use a comma to separate answers as needed.)