

Factor the following, completely. Note: determine what type of "factoring" is possible – Factoring out GCF, Factoring by Grouping, ac & b Method, Difference of Two Squares, or Sum/Difference of Two Cubes.

5. $49t^2 - 25s^2$ $a = 7t$ $b = 5s$

$$(7t + 5s)(7t - 5s)$$

6. $x^2 - 10x + 9$ $ac = 9$ $b = -10$ $\frac{-}{9} \mid \frac{-}{1}$

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

$$x(x - 9) - 1(x - 9)$$

$$(x - 9)(x - 1)$$

7. $x^2 + 13x - 30$ $ac = -30$ $b = 13$ $\frac{+}{15} \mid \frac{-}{2}$

$$x^2 + 15x - 2x - 30$$

$$x(x + 15) - 2(x + 15)$$

$$(x + 15)(x - 2)$$

8. $12t^2 - 23t + 5$ $ac = 60$ $b = -23$ $\frac{-}{20} \mid \frac{-}{3}$

$$12t^2 - 20t - 3t + 5$$

$$4t(3t - 5) - 1(3t - 5)$$

$$(3t - 5)(4t - 1)$$

9. $7w(2w - 3) - 8(2w - 3)$

$$(2w - 3)(7w - 8)$$

Solve the each equation by factoring.

10. $x^2 + 2x = 35$

$x^2 + 2x - 35 = 0$

$x^2 + 7x - 5x - 35 = 0$

$x(x+7) - 5(x+7) = 0$

$(x+7)(x-5) = 0$

$ac = -35 \quad b = 2 \quad \frac{+}{-}$
 $\frac{-}{+}$

① $x + 7 = 0$

$x = -7$

② $x - 5 = 0$

$x = 5$

11. $25p^2 - 4 = 0 \quad a = 5p \quad b = 2$

$(5p+2)(5p-2) = 0$

① $5p + 2 = 0$

$5p = -2$
 $p = -\frac{2}{5}$

② $5p - 2 = 0$

$5p = 2$
 $p = \frac{2}{5}$

Simplify the rational expression completely.

12. $\frac{1}{3x^2} \cdot \frac{3x^2}{20} = \frac{1}{x} \cdot \frac{3}{5} = \frac{3}{5x}$

13. $\frac{b^4}{c^4} \div \frac{9b^2}{c^2} = \frac{b^4}{c^4} \cdot \frac{c^2}{9b^2} = \frac{b^2}{c^2} \cdot \frac{1}{9} = \frac{b^2}{9c^2}$

14. $\frac{9}{10v} - \frac{7}{2v} \quad LCD: 10v$

$\frac{9 - 35}{10v} = -\frac{26}{10v} = -\frac{13}{5v}$

BONUS (5 Points)

$\frac{13}{54vw^2} + \frac{19}{24v^2w}$

$LCD: 2^3 \cdot 3^3$
 $= 8 \cdot 27$
 $= 216v^2w^2$

$54 = 2 \cdot 3^3$
 ③ · 27
 ③ · 9
 ③ · 3

$24 = 2^3 \cdot 3$
 ③ · 12
 ③ · 6
 ③ · 2

$\frac{13(4v) + 19(9w)}{216v^2w^2}$

$\frac{52v + 171w}{216v^2w^2}$