

Name: _____

Period: _____

Precal: 1.1 Worksheet

Find the indicated set if $A=\{1,2,3,4,5,6,7\}$, $B=\{2,4,6,8\}$, and $C=\{7,8,9,10\}$.

- | | |
|---------------|----------------------|
| 1. $A \cup B$ | 5. $A \cup C$ |
| 2. $A \cap B$ | 6. $A \cap C$ |
| 3. $B \cup C$ | 7. $A \cup B \cup C$ |
| 4. $B \cap C$ | 8. $A \cap B \cap C$ |

Express the interval in terms of inequalities and then graph the interval.

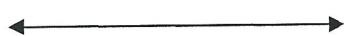
9. $(-3, 0)$



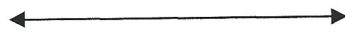
13. $(-\infty, 1)$



10. $(2, 8]$



14. $(-2, 3)$



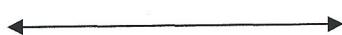
11. $[2, 8)$



15. $[-3, \infty)$



12. $[3, \infty)$



16. $(-\infty, 1]$



Express the inequality in interval notation and then graph the corresponding interval.

17. $x \leq 1$



20. $1 \leq x \leq 2$



$$18. -2 < x \leq 1$$



$$21. x \geq -5$$



$$19. x > -1$$



$$22. -5 < x < 2$$



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Precal: 1.2 worksheet

Simplify the expression and eliminate any negative exponent(s).

1. 5^3

2. $\left(\frac{3}{7}\right)^0$

3. 2^{-3}

4. $\frac{2^5}{2^2}$

5. 3^{-2}

6. $\frac{7^6}{7^4}$

7. $6^2 \bullet \left(\frac{1}{6^3}\right)$

8. $\frac{5^{-3}}{2^{-3}}$

9. $\frac{2^{-2}}{4^{-2}}$

10. $x^9 x^{-5}$

11. $(3y^2)(4y^5)$

12. $(12x^2y^4)\left(\frac{1}{2}x^5y\right)$

13. $\frac{x^9(2x)^4}{x^3}$

14. $\frac{x^{-3}b^4}{x^{-5}b^5}$

15. $\frac{10x^3y^{-2}z^{-5}}{2x^{-2}yz^{-3}}$

16. $\frac{(2x^2y^{-3})^3}{(3x^{-3}y)^2}$

17. $\frac{(5x^3)^2}{(x^4)^3}$

18. $\frac{20x^{-4}y^2z^{-5}}{10xy^5z^{-7}}$

Simplify the expression and eliminate any negative exponents.

$$19. \sqrt{81}$$

$$20. \sqrt{45}$$

$$21. \sqrt{32}$$

$$22. \sqrt{72}$$

$$23. \sqrt{32} + \sqrt{18}$$

$$24. \sqrt{75} + \sqrt{27}$$

$$25. \sqrt[4]{16}$$

$$26. \sqrt[3]{\frac{8}{27}}$$

$$27. \sqrt[3]{-\frac{1}{64}}$$

$$28. \sqrt[5]{96}$$

$$29. 36^{\frac{1}{2}}$$

$$30. 121^{\frac{1}{2}}$$

$$31. \left(\frac{8}{125}\right)^{\frac{2}{3}}$$

$$32. \left(\frac{1}{32}\right)^{\frac{1}{5}}$$

$$33. (16x^4y^{10})^{\frac{1}{2}}$$

$$34. (25x^8y^{12})^{\frac{1}{2}}$$

$$35. (27x^9y^{12})^{\frac{1}{3}}$$

$$36. (125x^6y^{18})^{\frac{2}{3}}$$

$$37. (8x^3y^{15})^{\frac{2}{3}}$$

$$38. \frac{1}{\sqrt{3}}$$

$$39. \sqrt{\frac{x}{5}}$$

$$40. \frac{1}{\sqrt{2}}$$

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Precal: 1-3 worksheet

Perform the indicated operation and simplify. Then find its degree.

$$1. (3x + 8) + (2x - 14)$$

$$2. (7 + x) - (3x - 12)$$

$$3. (3x^2 + x + 1) + (2x^2 - 3x - 5)$$

$$4. 5(2x^2 + 3x + 7) + 2(4x^2 - 8x - 1)$$

$$5. (3x^2 + x + 1) - (2x^2 - 3x - 5)$$

$$6. 4(x^2 + x - 8) - 3(2x^2 - 5x - 10)$$

$$7. (3x - 2)(5x + 1)$$

$$8. (x + 3)(x - 2)$$

$$9. (2x + 3)(5x^2 + 6x - 8)$$

Factor out the common factor (GCF).

$$10. 2x^2 + 10x$$

$$11. 3x^3 - 12x$$

$$12. 2x^3 - 8x^2 + 22x$$

$$13. 6x^2 + 15x - 21$$

Factor the trinomial.

$$14. x^2 + 2x - 3$$

$$15. x^2 - 8x + 15$$

$$16. x^2 + x - 12$$

$$17. x^2 + 10x + 21$$

$$18. x^2 - 4x - 12$$

$$19. 2x^2 + x - 3$$

$$20. 10x^2 - 13x - 3$$

$$21. 3x^2 + 7x + 2$$

$$22. 4x^2 - 9x - 9$$

$$23. 5x^2 - 3x - 2$$

Use a special factoring formula to factor.

$$24. x^2 - 49$$

$$25. x^3 + 27$$

$$26. 4x^2 - 25$$

$$27. 8x^3 - 125$$

$$28. 9x^2 - 16$$

$$29. 27x^3 + 1$$

$$30. 49x^2 - 100$$

$$31. x^3 - 8$$

Factor the expression by grouping.

$$32. x^3 + 4x^2 + x + 4$$

$$33. x^5 + x^4 + x + 1$$

$$34. 2x^3 + x^2 - 6x - 3$$

$$35. 3x^3 - x^2 + 6x - 2$$

Factor the expression completely (Hint: factor GCF out first).

$$36. 2x^2 - 4x - 16$$

$$37. 8x^2 - 50$$

$$38. 10x^2 + 25x + 15$$

$$39. 8x^3 + 125$$

$$40. 9x^2 - 36x - 45$$

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Precal: 1.4 worksheet

Find the domain of the expression.

$$1. \frac{2x-1}{x+4}$$

$$2. \frac{3x+5}{2x}$$

$$3. 2x^2 + 3x - 8$$

$$4. \frac{3}{\sqrt{x+2}}$$

$$5. \frac{2x-5}{15}$$

$$6. \frac{x-1}{\sqrt{x-1}}$$

Simplify the rational expression.

$$7. \frac{x^2 + 6x + 8}{x^2 + 5x + 4}$$

$$8. \frac{x^2 - x - 2}{x^2 - 1}$$

$$9. \frac{x^2 - x - 12}{x^2 + 5x + 6}$$

$$10. \frac{3x^2 - 15x}{x^2 - 25}$$

$$11. \frac{10x^2 - 20x}{5x^2 - 10x}$$

$$12. \frac{x^2 - 16}{x^2 - x - 20}$$

Perform the given operation. Then simplify.

$$13. \frac{x^2 - x - 12}{x^2 - 9} \bullet \frac{x + 3}{x - 4}$$

$$14. \frac{x^2 - 25}{x^2 - 16} \bullet \frac{x + 4}{2x^2 + 10x}$$

$$15. \frac{x^2 - x - 6}{x^2 + 2x} \bullet \frac{x^3 + x^2}{x^2 - 2x - 3}$$

$$16. \frac{x^2 + 2x - 15}{x^2 + 3x + 2} \div \frac{x + 5}{x + 1}$$

$$17. \frac{x^2 - 36}{2x^2 - 4x} \div \frac{x^2 + 8x + 12}{x^2 - 4}$$

$$18. \frac{2x^2 + 3x + 1}{x^2 + 2x - 15} \div \frac{x^2 + 6x + 5}{2x^2 - 7x + 3}$$

Perform the operation. Then simplify.

$$19. \frac{1}{x + 5} + \frac{2}{x - 3}$$

$$20. \frac{3}{x + 1} + \frac{5}{x - 1}$$

$$21. \frac{1}{x - 1} - \frac{1}{x + 2}$$

$$22. \frac{x}{x - 4} - \frac{3}{x + 6}$$

Rationalize the denominator.

$$23. \frac{1}{2 - \sqrt{3}}$$

$$24. \frac{2}{3 - \sqrt{5}}$$

$$25. \frac{4}{1 - \sqrt{2}}$$

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Precal: 1.5 worksheet

Solve the equation.

1. $2x + 7 = 31$

2. $\frac{1}{2}x - 8 = 1$

3. $5x - 13 = 12 - 5x$

4. $2(1 - x) = 3(1 + 2x) + 5$

Solve the equation by factoring.

5. $x^2 + x - 12 = 0$

6. $x^2 + 3x - 4 = 0$

7. $4x^2 - 4x - 15 = 0$

8. $2x^2 + 7x + 3 = 0$

Solve by completing the square.

9. $x^2 + 2x - 5 = 0$

10. $x^2 - 4x + 2 = 0$

11. $x^2 + 10x - 11 = 0$

12. $x^2 + 8x - 4 = 0$

Solve using the quadratic formula.

13. $x^2 - 2x - 15 = 0$

14. $2x^2 + x - 3 = 0$

15. $x^2 + 3x + 1 = 0$

16. $3x^2 + 7x + 4 = 0$

Find all real number solutions.

17. $\sqrt{x - 3} = 5$

18. $\sqrt{x + 1} + 2 = 0$

19. $2\sqrt{x + 5} + 1 = 13$

20. $|x + 5| = 7$

21. $|x - 3| - 4 = 10$

22. $2|x - 1| + 3 = 15$

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Precal: 1.7 Worksheet

Solve the linear equality. Express the answer as an inequality, interval form and graph.

1. $2x - 5 > 3$

2. $3x + 11 < 5$

3. $7 - x \geq 5$

4. $3x + 11 \leq 6x + 8$

5. $6 - x \geq 2x + 9$

6. $2 \leq x + 5 < 4$

7. $5 \leq 3x - 4 \leq 14$

8. $-1 < 2x - 5 < 7$

9. $1 < 3x + 4 \leq 16$

Solve the nonlinear inequality. Express the answer as an inequality, interval form, and graph.

10. $(x + 2)(x - 3) < 0$

11. $(x - 5)(x + 4) \geq 0$

$$12. \ x^2 - 3x - 18 \leq 0$$

$$13. \ x^2 + 5x + 6 > 0$$

$$14. \ 2x^2 + x - 1 \geq 0$$

$$15. \ x^2 - x - 2 < 0$$

Solve the absolute value inequality. Express the answer as an inequality, interval and graph.

$$16. \ |x| \leq 4$$

$$17. \ |3x| < 15$$

$$18. \ |x - 5| \leq 3$$

$$19. \ |x + 1| \geq 1$$

1.10 Exercises

1–8 ■ Find the slope of the line through P and Q .

- | | |
|-------------------------|-------------------------|
| 1. $P(0, 0), Q(4, 2)$ | 2. $P(0, 0), Q(2, -6)$ |
| 3. $P(2, 2), Q(-10, 0)$ | 4. $P(1, 2), Q(3, 3)$ |
| 5. $P(2, 4), Q(4, 3)$ | 6. $P(2, -5), Q(-4, 3)$ |
| 7. $P(1, -3), Q(-1, 6)$ | 8. $P(-1, -4), Q(6, 0)$ |

15–34 ■ Find an equation of the line that satisfies the given conditions.

15. Through $(2, 3)$; slope 1
16. Through $(-2, 4)$; slope -1
17. Through $(1, 7)$; slope $\frac{2}{3}$
18. Through $(-3, -5)$; slope $-\frac{7}{2}$
19. Through $(2, 1)$ and $(1, 6)$
20. Through $(-1, -2)$ and $(4, 3)$
21. Slope 3; y-intercept -2
22. Slope $\frac{2}{3}$; y-intercept 4
23. x-intercept 1; y-intercept -3
24. x-intercept -8 ; y-intercept 6
25. Through $(4, 5)$; parallel to the x -axis
26. Through $(4, 5)$; parallel to the y -axis
27. Through $(1, -6)$; parallel to the line $x + 2y = 6$
28. y-intercept 6; parallel to the line $2x + 3y + 4 = 0$
29. Through $(-1, 2)$; parallel to the line $x = 5$
30. Through $(2, 6)$; perpendicular to the line $y = 1$
31. Through $(-1, -2)$; perpendicular to the line $2x + 5y + 8 = 0$
32. Through $(\frac{1}{2}, -\frac{2}{3})$; perpendicular to the line $4x - 8y = 1$
33. Through $(1, 7)$; parallel to the line passing through $(2, 5)$ and $(-2, 1)$
34. Through $(-2, -11)$; perpendicular to the line passing through $(1, 1)$ and $(5, -1)$
35. (a) Sketch the line with slope $\frac{3}{2}$ that passes through the point $(-2, 1)$.
(b) Find an equation for this line.
36. (a) Sketch the line with slope -2 that passes through the point $(4, -1)$.
(b) Find an equation for this line.

41–52 ■ Find the slope and y-intercept of the line and draw its graph.

- | | |
|---|-------------------------|
| 41. $x + y = 3$ | 42. $3x - 2y = 12$ |
| 43. $x + 3y = 0$ | 44. $2x - 5y = 0$ |
| 45. $\frac{1}{2}x - \frac{1}{3}y + 1 = 0$ | 46. $-3x - 5y + 30 = 0$ |
| 47. $y = 4$ | 48. $4y + 8 = 0$ |
| 49. $3x - 4y = 12$ | 50. $x = -5$ |
| 51. $3x + 4y - 1 = 0$ | 52. $4x + 5y = 10$ |