

Name: \_\_\_\_\_

Work in groups to answer as many problems as you can. Ask questions if you get stuck.

1. In each of the following equations, solve for the variable.

(a)  $13 + 2(1 - u) = 8u - 5(u + 7)$

(c)  $8 - (4 - 12t) + 2 = 3t + 2(7 - 3t)$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(b)  $8(2 + 3z) + 1 = z - 10(z + 1)$

(d)  $2x(6x - 1) + 21 = 8x - x(3 - 12x)$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(e)  $\frac{6x + 24}{x + 4} = 5$

(f)  $\frac{6t - 1}{t^2 + 5t + 4} = -\frac{19}{t + 1}$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

2. Solve the following equations for the indicated variable.

(a) Solve  $A = 3p(4 - 2r)$  for  $p$ .

(c) Solve  $A = 3p(4 - 2r)$  for  $r$ .

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(b) Solve  $T = \frac{c}{3} \left( 6p + \frac{3q}{c} \right) - 7p$  for  $p$ .

(d) Solve  $T = \frac{c}{3} \left( 6p + \frac{3q}{c} \right) - 7p$  for  $c$ .

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(e) Solve  $3A + 6C = 4A(B - 7C)$  for  $C$ .

(h) Solve  $3A + 6C = 4A(B - 7C)$  for  $A$ .

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(f) Solve  $y = \frac{4 - 9x}{3}$  for  $x$ .

(i) Solve  $y = \frac{12}{1 - x}$  for  $x$ .

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(g) Solve  $y = \frac{7}{10x + 9}$  for  $x$ .

(j) Solve  $y = \frac{8 - 5x}{9 - 7x}$  for  $x$ .

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

3. Determine the number of distinct roots for each of the following polynomials. Do not find the roots.

(a)  $25x^2 - 120x + 619 = 0$

(e)  $\frac{1}{6}x^2 - 43 = 0$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(b)  $104x^2 - 75x - 14 = 0$

(f)  $97 + 136x + 289x^2 = 0$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(c)  $2x^2 + 60x + 450 = 0$

(g)  $10x^2 - 7x = 0$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(d)  $7x^2 - 17x + 5 = 0$

(h)  $\frac{49}{9}x^2 + \frac{14}{15}x + \frac{1}{25} = 0$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

4. Solve each of the following equations.

(a)  $x^2 - 4x + 3 = 0$

(b)  $4x^2 + x - 3 = 0$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(c)  $x + 6 = (x + 4)^2$

(f)  $2 - x = \sqrt{8 - 7x}$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(d)  $(x + 3)^2 = 11(x + 3)$

(g)  $\sqrt{1 + 3x} = 4 + \sqrt{5 - x}$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(e)  $x - 8 = \sqrt{22 - 3x}$

(h)  $\sqrt{x - 3} + \sqrt{x + 1} = 2$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

5. Solve each of the following inequalities. Give two solutions; one in inequality form and one in interval notation form. Ex.  $a < x \leq b$  and  $(a, b]$ .

(a)  $7x + 2(4 - x) < 12 - 3(5 + 6x)$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(d)  $\left(\frac{1}{3} - \frac{1}{6}z\right) > \frac{1}{9}z + 4\left(2 - \frac{7}{18}z\right)$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(b)  $10(3 + w) \geq 9(2 - 4w)$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(e)  $-4 < 7x + 8 \leq 1$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(c)  $2(4 + 5y) \leq 12y - 6(1 - 3y)$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(f)  $2 \leq 2 + 4(3 - x) \leq 6$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(g)  $-4 < 7x + 8 \leq 1$

Answer: \_\_\_\_\_

(j)  $0 \leq \frac{3}{7} - \frac{5}{14}x < \frac{1}{2}$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(h)  $\frac{1}{2} < 2\left(\frac{1}{4} + \frac{1}{8}t\right) < \frac{3}{4}$

Answer: \_\_\_\_\_

(k)  $-8 < 2(3 + 4x) - 4(1 + 3x) \leq 3$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(i)  $-12 \leq 4 - 11m \leq 3$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

6. Solve the following inequalities.

(a)  $z^2 - 11z + 24 < 0$

Answer: \_\_\_\_\_

(b)  $2x^2 - 3 \geq 5x$

(e)  $x^2 + 6x \geq -9$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(c)  $t^2 > 30 - 7t$

(f)  $u^2 + u \leq 1$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(d)  $m^2 - 7m \leq 8$

(g)  $w^2 + 4w - 12 > 0$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_



(h)  $x^2 + 49 > 14x$

(k)  $9u^2 - 6u + 1 < 0$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(i)  $t^2 \leq t$

(l)  $z^6 + 8z^5 + 12z^4 \geq 0$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_

(j)  $x^2 - 8x > -14$

(m)  $2w^3 - 3w^2 < 14w$

Answer: \_\_\_\_\_

Answer: \_\_\_\_\_