

INTERMEDIATE ALGEBRA REVIEW

The Mathematics Department at Onondaga Community College recommends that students who have taken Intermediate Algebra or Course III review this material prior taking the Placement Exam.

1. $|7 - 2x| = 11$

2. $|3x - 4| > 2$ (graph)

3. $-5 \leq 3x - 2 \leq 4$ (graph)

4. $\frac{7x - 5}{2} + 7 = 4x$

5. $A = -4h(x + 5)$ (For x)

6. Factor: $36x^3 + 12x^2 - 48x$

7. Factor: $a^4 - b^4$

8. Factor: $x^3 + 64y^3$

9. Divide: $(3x^2 + 7x + 7)$ by $(3x + 1)$

10. Solve: $3x^2 - 4x - 3 = 0$

11. Simplify: $\frac{4x - 48}{x^2 - 144}$

12. $\frac{\frac{x + 5}{3x^2}}{\frac{x^2 - 25}{6x^3}}$

13. $\frac{2x}{x+2} + \frac{5}{x-5}$

14. $\left(\frac{x^2 - 9}{2x + 2}\right) \cdot \left(\frac{x^2 + 2x + 1}{(x - 3) \cdot (x + 1)}\right)$

15. $\sqrt{2x+1} + 1 = 4$

16. $(4\sqrt{5} - 2) \cdot (2\sqrt{5} + 4)$

17. $\sqrt{125} + 2\sqrt{20} - 4\sqrt{45}$

18. $\left(\sqrt{14x^3y}\right) \cdot \left(\sqrt{7x^3y^3}\right)$

19. $\sqrt{\frac{375x^5}{5x}}$

20. Find the slope of the line $7x + 3y = 21$.

21. Find the slope of the line containing the points $(-3, 5)$ and $(6, -1)$.

22. Find the equation of the line passing through $(-6, 2)$ with a slope of -2 .

23. Write the equation of the line through $(2, 5)$ and perpendicular to $y = 2x + 4$.

24. Write $-12 - \sqrt{-121}$ in standard complex number form.

25. Solve for x , y and z

$$2x - 3y + z = 1$$

$$x + 2y + z = -1$$

$$3x - y + 3z = 4$$

26. Graph $y \geq 3x + 1$

INREMEDIA ALGEBRA REVIEW

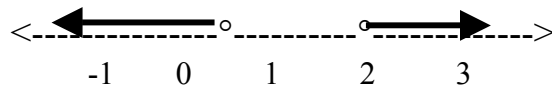
ANSWERS TO THE PROBLEMS

1. $|7 - 2x| = 11$

$$\begin{array}{rcl} 7 - 2x = 11 & & 7 - 2x = -11 \\ -2x = 4 & & -2x = -18 \\ x = -2 & & x = 9 \end{array}$$

2. $|3x - 4| > 2$

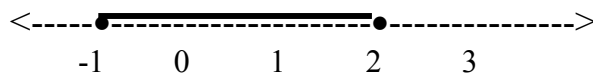
$$\begin{array}{rcl} 3x - 4 > 2 & \text{or} & 3x - 4 < -2 \\ 3x > 6 & & 3x < 2 \\ x > 2 & & x < \frac{2}{3} \end{array}$$



3. $-5 \leq 3x - 2 \leq 4$

$$-3 \leq 3x \leq 6$$

$$-1 \leq x \leq 2$$



4. $\frac{7x - 5}{2} + 7 = 4x$

$$7x - 5 + 14 = 8x$$

$$9 = x$$

5. $A = -4h(x + 5)$

$$\frac{A}{-4h} = x + 5$$

$$\frac{A}{-4h} - 5 = x$$

6. $36x^3 + 12x^2 - 48x$

$$12x(3x^2 + x - 4)$$

$$12x(3x + 4)(x - 1)$$

7. $a^4 - b^4$
 $(a^2 - b^2)(a^2 + b^2)$
 $(a - b)(a + b)(a^2 + b^2)$

8. $x^3 + 64y^3$
 $(x + 4)(x^2 - 4x + 16)$

$$3x + 1 \overline{) 3x^2 + 7x + 7} \quad \begin{array}{l} x + 2 \\ R = 5 \end{array}$$

9.
$$\frac{-3x^2 + 1x}{6x + 7}$$

$$\frac{-6x + 2}{5}$$

10. $3x^2 - 4x - 3 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(3)(-3)}}{2(3)}$$

$$x = \frac{4 \pm \sqrt{16 + 36}}{6} = \frac{4 \pm \sqrt{52}}{6} = \frac{4 \pm 2\sqrt{13}}{6} = \frac{2 \pm \sqrt{13}}{3}$$

11.
$$\frac{4x - 48}{x^2 - 144} = \frac{4(x - 12)}{(x - 12)(x + 12)} = \frac{4}{x + 12}$$

$$12. \frac{\frac{x+5}{3x^2}}{\frac{x^2-25}{6x^3}} = \frac{x+5}{3x^2} \cdot \frac{6x^3}{x^2-25} = \frac{(x+5) \cdot (6x^3)}{(3x^2) \cdot (x+5) \cdot (x-5)} = \frac{2x}{x-5}$$

$$13. \frac{2x}{x+2} + \frac{5}{x-5} = \frac{2x^2 - 10x + 5x + 10}{(x+2)(x-5)} = \frac{2x^2 - 5x + 10}{(x+2)(x-5)}$$

$$14. \left(\frac{x^2 - 9}{2x + 2} \right) \cdot \left(\frac{x^2 + 2x + 1}{(x-3) \cdot (x+1)} \right) = \frac{(x-3) \cdot (x+3)}{2(x+1)} = \frac{(x+1) \cdot (x+1)}{(x-3) \cdot (x+1)} = \frac{x+3}{2}$$

$$15. \begin{aligned} \sqrt{2x+1} + 1 &= 4 \\ \sqrt{2x+1} &= 3 \\ 2x+1 &= 9 \\ x &= 4 \end{aligned}$$

$$16. \begin{aligned} &4\sqrt{5} - 2 \\ &\frac{2\sqrt{5} + 4}{8.5 - 4\sqrt{5}} \\ &\frac{+16\sqrt{5} - 8}{40 + 12\sqrt{5} - 8} \\ &32 + 12\sqrt{5} \end{aligned}$$

$$17. \sqrt{125} + 2\sqrt{20} - 4\sqrt{45} = \sqrt{5 \cdot 25} + 2\sqrt{5 \cdot 4} - 4\sqrt{5 \cdot 9} = 5\sqrt{5} + 4\sqrt{5} - 12\sqrt{5} = -3\sqrt{5}$$

$$18. \left(\sqrt{14x^3y} \right) \cdot \left(\sqrt{7x^3y^3} \right) = \sqrt{98x^6y^4} = 7x^3y^2\sqrt{2}$$

$$19. \sqrt{\frac{375x^5}{5x}} = \sqrt{75x^4} = 5x^2\sqrt{3}$$

20. $7x + 3y = 21$

$$\frac{3y}{3} = \frac{-7x}{3} + \frac{21}{3}$$

$$y = -\frac{7x}{3} + 7$$

$$m = -\frac{7}{3}$$

21. $m = \frac{-1-5}{6-(-3)} = \frac{-6}{9} = -\frac{2}{3}$

22. $y - y_1 = m(x - x_1)$

$$y - 2 = -2(x + 6)$$

$$y - 2 = -2x - 12$$

$$y = -2x - 10$$

23. $y = 2x + 4$ $m = 2$ perpendicular $m = -\frac{1}{2}$

$$y - y_1 = m(x - x_1)$$

$$y - 5 = -\frac{1}{2}(x - 2)$$

$$y - 5 = -\frac{1}{2}x + 1$$

$$y = -\frac{1}{2}x + 6$$

24. $-12 - \sqrt{-121}$

$$-12 - 11i$$

25. $2x - 3y + z = 1$

$$x + 2y + z = -1$$

$$3x - y + 3z = 4$$

$$-x + 5(-1) = -2$$

$$-x = 3$$

$$x = -3$$

$$(-3, -1, 4)$$

$$-2x + 3y - z = -1$$

$$x + 2y + z = -1$$

$$-x + 5y = -2$$

$$x + 2y + z = -1$$

$$-3 + 2(-1) + z = -1$$

$$-5 + z = -1$$

$$z = 4$$

$$-3x - 6y - 3z = 3$$

$$3x - y + 3z = 4$$

$$-7y = 7$$

$$y = -1$$

26.