

Algebra P4

Spring Final Review 2 of 3

Directions: Do not use a calculator. All answers must be simplified and exact.

Solve each equation for x.

34) $3x - 5 = \frac{2}{3}(x - 4)$

$9x - 15 = 2x - 8$

$7x = 7$

$x = 1$

If you don't like fractions... multiply both sides by 3... I did.

35) $2\sqrt{x+3} - 1 = 7$

$2\sqrt{x+3} = 8$

$\sqrt{x+3} = 4$

$x+3 = 16$

$x = 13$

36) $\frac{x-3}{x-1} = \frac{x}{x+4}$

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

$x^2 - x = x^2 + x - 12$

$2x = 12$ $x = 6$

37) $|2x - 1| < 7$

$-7 < 2x - 1 < 7$

$-6 < 2x < 8$

$-3 < x < 4$

38) $0 = 2x^2 - 4x + 1$

$x = \frac{4 \pm \sqrt{16 - 4(1)(2)}}{2(2)}$

$x = \frac{4 \pm \sqrt{8}}{4} = \frac{4 \pm 2\sqrt{2}}{4}$

$x = 1 \pm \frac{1}{2}\sqrt{2}$

39) $x^3 = 11x^2 - 18x$

$x^3 - 11x^2 + 18x = 0$

$x(x-9)(x-2) = 0$

$x = 0, 9, 2$

40) $2(x+3)^2 = 18$

$(x+3)^2 = 9$

$x+3 = \pm 3$

$x = 0, -6$

41) $\sqrt{2x+8} = x$

$2x+8 = x^2$

$x^2 - 2x - 8 = 0$

$(x-4)(x+2) = 0$

$x = 4$

42) $\frac{x-2}{3x} = \frac{1}{4}$

$4x - 8 = 3x$

$x = 8$

multiply both sides by 6 to get rid of fractions

43) $x^2 = 32x$

$x^2 - 32x = 0$

$x(x-32) = 0$

$x = 0, 32$

44) $4x^2 - 16x = -15$

$4x^2 - 16x + 15 = 0$

$(2x-3)(2x-5) = 0$

$x = \frac{3}{2}, \frac{5}{2}$

45) $-\frac{1}{2}x + 7 = 4x + \frac{7}{3}$

$-3x + 42 = 24x + 14$

$27x = 28$

$x = \frac{28}{27}$

46) $\frac{1}{3}(x-1) = 2$

$x-1 = 6$

$x = 7$

47) $-3|x+5| \leq -12$

$|x+5| \geq 4$

$x+5 \geq 4$ or $x+5 \leq -4$

$x \geq -1$ or $x \leq -9$

48) $4x^2 - 9 = 3$

$4x^2 = 12$

$x^2 = 3$

$x = \pm\sqrt{3}$

49) $5x^2 - 2x - 1 = 0$

$x = \frac{2 \pm \sqrt{(-2)^2 - 4(5)(-1)}}{2(5)}$

$= \frac{2 \pm \sqrt{24}}{10} = \frac{2 \pm 2\sqrt{6}}{10} = \frac{1 \pm \sqrt{6}}{5}$

50) $25x^2 - 100 = 0$

$(5x-10)(5x+10) = 0$

$x = 2, -2$

51) $3 + |x-3| = 8$

$|x-3| = 5$

$x-3 = 5$ or $x-3 = -5$

$x = 8, -2$

State the excluded value(s).

52) $\frac{3d^2+d}{3d+1}$

$$3d+1 \neq 0$$

$$\boxed{d \neq -\frac{1}{3}}$$

53) $\frac{x^2+10x+24}{x^2+x-12}$

$$x^2+x-12 \neq 0$$

$$(x+4)(x-3) \neq 0$$

$$\boxed{x \neq -4, 3}$$

54) $\frac{c^2-9}{3c+9}$

$$3c+9 \neq 0$$

$$\boxed{c \neq -3}$$

55) Find the slope of the line that contains the points:

a) (4, -1) (6, -3)

b) (-7, 1) (-7, 8)

$$\frac{-3-(-1)}{6-4} = \boxed{-1}$$

$$\frac{8-1}{-7-(-7)} = \frac{7}{0} = \boxed{\text{undefined}}$$

Find the slope and y-intercept of each line:

56) $x-4y=8$

$$y = \frac{1}{4}x - 2$$

$$\boxed{m = \frac{1}{4} \text{ y-int} = (0, -2)}$$

57) $x=4$

$$\boxed{m = \text{undefined} \\ \text{y-int} = \text{none}}$$

58) $y=-2$

$$\boxed{m = 0 \\ \text{y-int} = (0, -2)}$$

Find the equation of each line. Use point-slope but leave your answer in slope-intercept form ($y=mx+b$).

59) slope = -3 through the point (1, 4).

$$y-4 = -3(x-1)$$

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

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

60) through the points (-5, 6) and (-2, -3)

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

$$y-6 = -3(x+5)$$

$$\boxed{y = -3x-9}$$

61) parallel to $y=-2x+1$ through (-4, -1)

$$y+1 = -2(x+4)$$

$$\boxed{y = -2x-9}$$