

Spiral Review

Find the equation of a line given the following conditions.

1. $m = 2; (-8, 2)$
 $y - 2 = 2(x + 8)$

$$y - 2 = 2x + 16$$
$$\begin{array}{r} +2 \\ +2 \end{array}$$

$$\boxed{y = 2x + 18}$$

3. Simplify

$$\frac{2}{a^2 - b^2} + \frac{3}{a + b}$$

$$\frac{2}{(a+b)(a-b)} + \frac{3(a-b)}{(a+b)(a-b)}$$

$$\boxed{\frac{2 + 3a - 3b}{(a+b)(a-b)}}$$

2. parallel to $y = 3x - 8$ $m_1 = 3$
passing through $(-5, 3)$

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

$$y - 3 = 3x + 15$$
$$\begin{array}{r} +3 \\ +3 \end{array}$$

$$\boxed{y = 3x + 18}$$

4. Factor.

$$32a^7b + 108ab^7$$

$$4ab(8a^6 + 27b^6)$$

$$4ab(2a^2 + 3b^3)(4a^4 - 6a^2b^3 + 9b^6)$$

Review: Solving equations w/ Radicals and Absolute Values

To solve an equation with a radical:

- 1.) Isolate the radical (only leave one radical on a side)
- 2.) Raise both side of the equation to proper power to eliminate radical.
- 3.) Simplify and solve.
- 4.) Check to see if answer(s) work.

To solve an equation with an absolute value.

- 1.) Isolate the absolute value.
- 2.) Divide into "positive case" and "negative case"
- 3.) Simplify and solve.
- 4.) Check to see if answer(s) work.

Find all the solution of the equation.

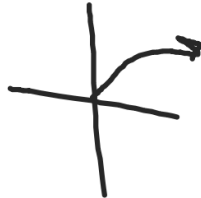
$$1. \sqrt{x+2} - 5 = 0$$

$$\frac{\sqrt{x+2} - 5 = 0}{+5 \quad +5}$$

$$(\sqrt{x+2})^2 = (5)^2$$

$$\frac{x+2 = 25}{-2 \quad -2}$$

$$\boxed{x=23} \checkmark$$



$$2. \sqrt[3]{2x+5} + 3 = 0$$

$$\frac{\sqrt[3]{2x+5} + 3 = 0}{-3 \quad -3}$$

$$(\sqrt[3]{2x+5})^3 = (-3)^3$$

$$\frac{2x+5 = -27}{-5 \quad -5}$$

$$\frac{2x = -32}{2}$$

$$\boxed{x=-16} \checkmark$$



$$3. (\sqrt{x+5})^2 = (\sqrt{x-5})^2$$

$$\frac{x+5 = x-5}{+5 \quad +5}$$

$$\frac{x+10 = x}{-x \quad -x}$$

$$10 \neq 0$$

no solution

$$4. \sqrt{x} + \sqrt{x-20} = 10$$

$$\frac{\sqrt{x} + \sqrt{x-20} = 10}{-\sqrt{x} \quad -\sqrt{x}}$$

$$(\sqrt{x-20})^2 = (10-\sqrt{x})^2$$

$$x-20 = (10-\sqrt{x})(10-\sqrt{x})$$

$$x-20 = 100 - 10\sqrt{x} - 10\sqrt{x} + x$$

$$\frac{x-20 = 100 - 20\sqrt{x} + x}{-100 \quad -100}$$

$$\frac{x-120 = -20\sqrt{x} + x}{-x \quad -x}$$

$$\frac{-120 = -20\sqrt{x}}{-20 \quad -20}$$

$$(6)^2 = (\sqrt{x})^2$$

$$\boxed{x=36} \checkmark$$

$$5. (x^2 - x - 22)^{\frac{4}{3}} = 16$$

$$\left(\sqrt[3]{(x^2 - x - 22)^4} \right)^3 = (16)^3$$

$$\sqrt[4]{(x^2 - x - 22)^4} = \sqrt[4]{4096}$$

$$4096 \square (1/4)$$

$$\frac{x^2 - x - 22}{-8} = \frac{16}{-8}$$

$$x^2 - x - 22 = -8$$

$$x^2 - x - 30 = 0$$

$$(x+5)(x-6) = 0$$

$$x = -5, x = 6 \checkmark$$

$$6. 4x^2(x-1)^{\frac{1}{3}} + 6x(x-1)^{\frac{4}{3}} = 0$$

$$2x(x-1)^{\frac{1}{3}} \left[2x + 3(x-1) \right] = 0$$

$$2x(x-1)^{\frac{1}{3}} [5x-3] = 0$$

$$\downarrow$$

$$2x = 0$$

$$x = 0 \checkmark$$

$$\downarrow$$

$$\sqrt[3]{x-1} = 0$$

$$x = 1 \checkmark$$

$$\downarrow$$

$$5x - 3 = 0$$

$$x = \frac{3}{5} \checkmark$$

$$7. |3x + 2| = 7$$

$$\begin{array}{l} \underline{(+)} \\ 3x+2=7 \\ 3x=5 \\ \boxed{x=\frac{5}{3}} \checkmark \end{array}$$

$$\begin{array}{l} \underline{(-)} \\ 3x+2=-7 \\ 3x=-9 \\ \boxed{x=-3} \checkmark \end{array}$$

$$8. |x - 10| = x^2 - 10x$$

$$\begin{array}{l} \underline{(+)} \\ x-10 = x^2 - 10x \\ \begin{array}{r} -x \\ \hline -10 = x^2 - 11x \\ +10 \qquad +10 \end{array} \\ \hline 0 = x^2 - 11x + 10 \\ 0 = (x-10)(x-1) \\ \boxed{x=10, x=1} \end{array}$$

$$\begin{array}{l} \underline{(-)} \\ x-10 = -(x^2 - 10x) \\ x-10 = -x^2 + 10x \\ \begin{array}{r} +x^2 \qquad +x^2 \\ \hline x^2 + x - 10 = 10x \\ -10x \qquad -10x \\ \hline x^2 - 9x - 10 = 0 \\ (x-10)(x+1) = 0 \\ \boxed{x=10, x=-1} \checkmark \end{array} \end{array}$$

9. (a) graph the equation with calculator
 (b) use graph to approximate x-intercepts on graph
 (c) set $y=0$ and solve equation
 (d) compare the results

$$y = x^4 - 10x^2 + 9$$

Turn-in problems:

1. $\sqrt{2x + 7} - x = 2$

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

3. $(x + 1)^{\frac{2}{3}} = 4$

4. Graph and approximate the x-intercept(s)

$$y = x^2 - 3x - 4$$

Assignment:

wkst (131-149, 155-159 odds)