

Find the distance between the points $(-5, -3)$ and $(3, -7)$. Write your final answer using radicals.

SCORE: ____ / 6 PTS

$$\begin{aligned} & \sqrt{(3 - -5)^2 + (-7 - -3)^2} \\ &= \sqrt{8^2 + (-4)^2} \\ &= \sqrt{80} = 4\sqrt{5} \end{aligned}$$

Perform the indicated operations and simplify. Write your final answers using fractional exponents.

SCORE: ____ / 10 PTS

[a] $\frac{\sqrt[6]{w}}{\sqrt[10]{w}} = \frac{w^{\frac{1}{6}}}{w^{\frac{1}{10}}}$

$$\begin{aligned} &= w^{\frac{1}{6} - \frac{1}{10}} \\ &= w^{\frac{5-3}{30}} \\ &= w^{\frac{2}{30}} = w^{\frac{1}{15}} \end{aligned}$$

[b] $k^{\frac{2}{3}} k^6 = k^{\frac{2}{3} + 6}$

$$= k^{\frac{20}{3}}$$

Simplify $\sqrt{686}$.

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$$\begin{array}{r} 2 \overline{) 686} \\ \underline{7 \overline{) 343}} \\ 7 \overline{) 49} \\ \underline{7 \overline{) 7}} \\ 1 \end{array} \quad 7\sqrt{14}$$

Find the center and radius of the circle $x^2 + y^2 + 12x - 10y + 13 = 0$.

SCORE: ____ / 8 PTS

$$\begin{aligned} x^2 + 12x + 36 + y^2 - 10y + 25 &= -13 + 36 + 25 \\ (x+6)^2 + (y-5)^2 &= 48 \\ \text{CENTER } (-6, 5) \\ \text{RADIUS } \sqrt{48} &= 4\sqrt{3} \end{aligned}$$

Perform the indicated operations and simplify. Write your final answers using radicals.

SCORE: ____ / 14 PTS

[a] $\sqrt{18g^7} \sqrt{30g^9}$

$2 \cdot 3 \sqrt{3 \cdot 5} \sqrt{g^{16}}$

$6\sqrt{15}g^8$

$\begin{array}{r} 2 \overline{)18} \quad 2 \overline{)30} \\ 3 \overline{)9} \quad 3 \overline{)15} \\ 3 \overline{)3} \quad 5 \overline{)5} \\ 1 \quad 1 \end{array}$

[b] $(2\sqrt{5} + \sqrt{2})(\sqrt{15} - 4\sqrt{6})$

$2\sqrt{75} - 8\sqrt{30} + \sqrt{30} - 4\sqrt{12}$

$2(5\sqrt{3}) - 7\sqrt{30} - 4(2\sqrt{3})$

$10\sqrt{3} - 7\sqrt{30} - 8\sqrt{3}$

$2\sqrt{3} - 7\sqrt{30}$

Simplify $\sqrt{54r^9a^{16}v^{11}}$. Write your final answer using radicals.

SCORE: ____ / 6 PTS

$\sqrt{9r^8a^{16}v^{10}} \sqrt{6rv} = 3r^4a^8v^5\sqrt{6rv}$

Find the equation of the circle with center $(9, -1)$ and radius 4.

SCORE: ____ / 6 PTS

$(x-9)^2 + (y-(-1))^2 = 4^2 \rightarrow (x-9)^2 + (y+1)^2 = 16$

Translate the following sentence into an absolute value equation or inequality.

SCORE: ____ / 6 PTS

"x is at least 7 away from -5"

DISTANCE BETWEEN x AND -5 IS GREATER THAN OR EQUAL TO 7

$|x - (-5)| \geq 7 \rightarrow |x + 5| \geq 7$

Write using fractional and/or negative exponents (where applicable).

SCORE: ____ / 8 PTS

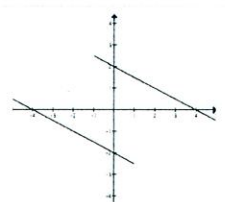
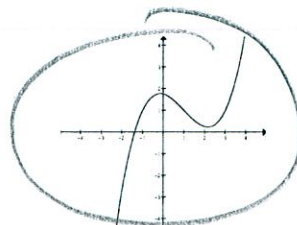
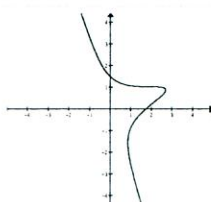
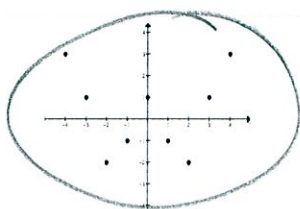
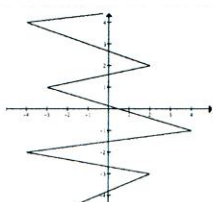
[a] $(\sqrt[n]{n})^{20} = n^{\frac{20}{n}} = n^4$

[b] $\frac{1}{\sqrt{p^{25}}} = \frac{1}{p^{\frac{25}{2}}} = p^{-\frac{25}{2}}$

[c] $\sqrt[4]{b^{11}} = b^{\frac{11}{4}}$

Circle the two graphs below that represent functions.

SCORE: ____ / 6 PTS



The equation $9 - |13 - 5x| = 6$ has two solutions. One solution is $x = 2$. Find the other solution.

SCORE: ____ / 8 PTS

Check your answer.

$$-|13 - 5x| = -3$$

$$|13 - 5x| = 3$$

$$13 - 5x = 3 \text{ or } 13 - 5x = -3$$

$$-5x = -10$$

$$x = 2$$

$$-5x = -16$$

$$x = \frac{16}{5}$$

$$9 - |13 - 5(\frac{16}{5})|$$

$$= 9 - |13 - 16|$$

$$= 9 - |-3|$$

$$= 9 - 3$$

$$= 6 \checkmark$$

If $f(x) = 2x^2 - 5x - 7$, find $f(a-3)$.

SCORE: ____ / 8 PTS

$$2(a-3)^2 - 5(a-3) - 7$$

$$= 2(a^2 - 6a + 9) - 5a + 15 - 7$$

$$= 2a^2 - 12a + 18 - 5a + 15 - 7$$

$$= 2a^2 - 17a + 26$$

Rationalize the denominator and simplify.

SCORE: ____ / 12 PTS

[a] $\frac{14}{5\sqrt{21}} \cdot \frac{\sqrt{21}}{\sqrt{21}}$

$$= \frac{14\sqrt{21}}{5 \cdot 21}$$

$$= \frac{2\sqrt{21}}{15}$$

[b] $\frac{15}{4+\sqrt{10}} \cdot \frac{4-\sqrt{10}}{4-\sqrt{10}}$

$$= \frac{15(4-\sqrt{10})}{16-10}$$

$$= \frac{15(4-\sqrt{10})}{6}$$

$$= \frac{5(4-\sqrt{10})}{2}$$

Solve the equation $17 - 4\sqrt{1-h} = 5$ using algebra. Check your answer(s).

SCORE: ____ / 8 PTS

$$-4\sqrt{1-h} = -12$$

$$\sqrt{1-h} = 3$$

$$1-h = 9$$

$$h = -8$$

$$17 - 4\sqrt{1-h}$$

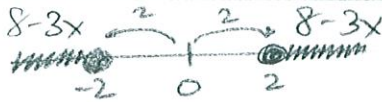
$$= 17 - 4\sqrt{9}$$

$$= 17 - 4(3)$$

$$= 17 - 12$$

$$= 5 \checkmark$$

Solve $|8 - 3x| \geq 2$.



SCORE: ____ / 10 PTS

$$8 - 3x \leq -2 \text{ or } 8 - 3x \geq 2$$

$$-3x \leq -10 \text{ or } -3x \geq -6$$

$$x \geq \frac{10}{3} \text{ or } x \leq 2$$

$$x \leq 2 \text{ or } x \geq \frac{10}{3}$$

Divide. Rationalize the denominator and simplify.

SCORE: ____ / 6 PTS

$$\frac{\sqrt{6}}{\sqrt{108}} = \frac{\sqrt{6}}{\sqrt{6} \sqrt{18}} = \frac{1}{\sqrt{18}} = \frac{1}{3\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{6}$$

$$\text{or } \frac{1}{\sqrt{18}} \cdot \frac{\sqrt{18}}{\sqrt{18}} = \frac{\sqrt{18}}{18} = \frac{3\sqrt{2}}{18} = \frac{\sqrt{2}}{6}$$

$$\text{or } \frac{\sqrt{6}}{\sqrt{108}} \cdot \frac{\sqrt{108}}{\sqrt{108}} = \frac{\sqrt{648}}{108} = \frac{18\sqrt{2}}{108} = \frac{\sqrt{2}}{6}$$

$$\begin{array}{r} 2 \overline{) 648} \\ 2 \overline{) 324} \\ 2 \overline{) 162} \\ 3 \overline{) 81} \\ 3 \overline{) 27} \\ 3 \overline{) 9} \\ 3 \overline{) 3} \\ 1 \end{array}$$

Solve the equation $m + \sqrt{26 - 5m} = 4$ using algebra. Check your answer(s).

SCORE: ____ / 12 PTS

$$\sqrt{26 - 5m} = 4 - m$$

$$26 - 5m = (4 - m)^2$$

$$26 - 5m = 16 - 8m + m^2$$

$$0 = m^2 - 3m - 10$$

$$0 = (m - 5)(m + 2)$$

$$m = 5 \text{ or } m = -2$$

$$m = 5: 5 + \sqrt{26 - 5(5)}$$

$$= 5 + \sqrt{1}$$

$$= 5 + 1$$

$$= 6 \quad \times$$

$$m = -2: -2 + \sqrt{26 - 5(-2)}$$

$$= -2 + \sqrt{36}$$

$$= -2 + 6$$

$$= 4 \quad \checkmark$$