Write using fractional and/or negative exponents (where applicable). **SCORE: ____ / 8 PTS**

[a] $(\sqrt[5]{n})^{20} = n^{\frac{20}{5}} = n^4$

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

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

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

$|x - -5| \geq 7 \longrightarrow |x+5| \geq 7$

Find the equation of the circle with center $(9, -1)$ and radius 4. **SCORE: ____ / 6 PTS**

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

Simplify $\sqrt{54r^9a^{16}v^{11}}$. **Write your final answer using radicals.** **SCORE: ____ / 6 PTS**

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

Perform the indicated operations and simplify. **Write your final answers using radicals.** **SCORE: ____ / 14 PTS**

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

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

$6\sqrt{15}g^8$

2 | 18	2 | 30
3 | 9	3 | 15
3 | 3	5 | 5
1	1

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

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

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

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

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

Solve the equation $17 - 4\sqrt{1-h} = 5$ using algebra. **Check your answer(s).** **SCORE: ____ / 8 PTS**

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

$\sqrt{1-h} = 3$

$1-h = 9$

$\boxed{h = -8}$

$17 - 4\sqrt{1-(-8)}$

$= 17 - 4\sqrt{9}$

$= 17 - 4(3)$

$= 17 - 12$

$= 5$ ✓

Rationalize the denominator and simplify. **SCORE: ____ / 12 PTS**

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

$= \frac{14\sqrt{21}}{5(21)}$

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

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

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

$= \frac{15(4-\sqrt{10})}{6} = \frac{5(4-\sqrt{10})}{2}$

If $f(x) = 2x^2 - 5x - 7$, find $f(a-3)$. **SCORE: ____ / 8 PTS**

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

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

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

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

The equation $9 - |13 - 5x| = 6$ has two solutions. One solution is $x = 2$. Find the other solution. **SCORE: ____ / 8 PTS**

Check your answer.

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

$|13-5x| = 3$

$13-5x = 3$ OR $13-5x = -3$

$-5x = -10$ $\quad -5x = -16$

$x = 2$ $\quad \boxed{x = \frac{16}{5}}$

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

$= 9 - |13 - 16|$

$= 9 - |-3|$

$= 9 - 3$

$= 6$ ✓

Divide. Rationalize the denominator and simplify.

SCORE: _____ / 6 PTS

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

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

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

$648 = 2^3 \cdot 3^4$

2 | 648
2 | 324
2 | 162
3 | 81
3 | 27
3 | 9
3 | 3
1

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

SCORE: _____ / 12 PTS

$$\sqrt{26-5m} = 4-m$$
$$26-5m = (4-m)^2$$
$$26-5m = 16-8m+m^2$$
$$0 = m^2-3m-10$$
$$0 = (m-5)(m+2)$$
$$m = 5 \text{ OR } \boxed{m=-2}$$

$m=5$: $5 + \sqrt{26-5(5)}$
$= 5 + \sqrt{1}$
$= 5+1$
$= 6$ ×

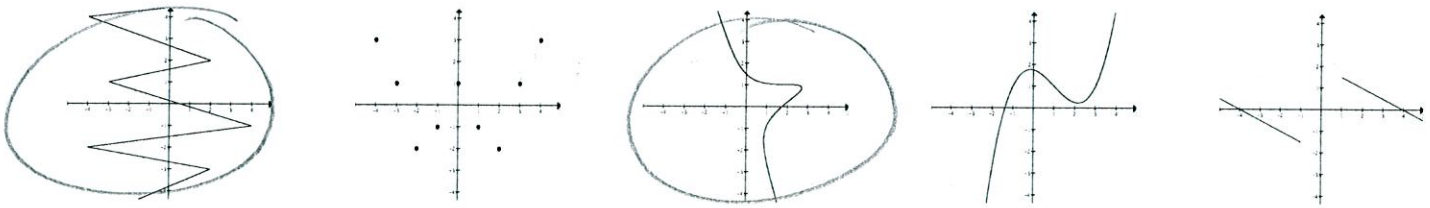
$m=-2$: $-2 + \sqrt{26-5(-2)}$
$= -2 + \sqrt{36}$
$= -2+6$
$= 4$ ✓

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

SCORE: _____ / 10 PTS

$$8-3x \leq -2 \text{ OR } 8-3x \geq 2$$
$$-3x \leq -10 \text{ OR } -3x \geq -6$$
$$x \geq \frac{10}{3} \text{ OR } x \leq 2$$
$$x \leq 2 \text{ OR } x \geq \frac{10}{3}$$

Circle the **two** graphs below that **DO NOT** represent functions. **SCORE: ____ / 6 PTS**



Find the center and radius of the circle $x^2 + y^2 + 12x - 10y + 13 = 0$. **SCORE: ____ / 8 PTS**

$x^2+12x+36+y^2-10y+25 = -13+36+25$

$(x+6)^2 + (y-5)^2 = 48$

CENTER $(-6, 5)$

RADIUS $\sqrt{48} = 4\sqrt{3}$

Simplify $\sqrt{686}$. **SCORE: ____ / 6 PTS**

$2 \mid 686$

$7 \mid 343$

$7 \mid 49$

$7 \mid 7$

1

$7\sqrt{14}$

Perform the indicated operations and simplify. **Write your final answers using fractional exponents.** **SCORE: ____ / 10 PTS**

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

$= w^{\frac{1}{6}-\frac{1}{10}}$

$= w^{\frac{5-3}{30}}$

$= w^{\frac{2}{30}} = w^{\frac{1}{15}}$

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

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

Find the distance between the points $(-5, -3)$ and $(3, -7)$. **Write your final answer using radicals.** **SCORE: ____ / 6 PTS**

$\sqrt{(3-(-5))^2 + (-7-(-3))^2}$

$= \sqrt{8^2 + (-4)^2}$

$= \sqrt{80} = 4\sqrt{5}$