DO ODD PROBLEMS ONLY!

Pre-Calculus Placement Test

Name: _____

Date: _____ **Per:** _____

Unit 1 Test

Fundamental Skills

1. Simplify the expression below.

$$(9m^3n^5)^{-2} \cdot (-6m^2n)^4$$

A. $\frac{m^2}{16n^6}$

B. $\frac{4m^2}{3n^6}$

C. $\frac{16m^2}{n^6}$

D. $\frac{16}{m^{48}n^{40}}$

2. Simplify the expression below.

$$2x^6y^2(4x^2y^3 - 3y) + 3x^8y^5$$

A. $11x^{16}y^{10} - 6x^6y^3$

B. $11x^8y^5 - 6x^6y^3$

C. $8x^{12}y^6 + 3x^8y^5 - 6x^6y^2$

D. $5x^{14}y^9$

3. Simplify the expression below.

$$(4y + 1)^3$$

A. $12y^3 + 1$

B. $64y^3 + 1$

C. $64y^3 + 48y^2 + 16y + 3$

D. $64y^3 + 48y^2 + 12y + 1$

4. Completely factor the expression below.

$$c^4 - c^2 - 72$$

5. Completely factor the expression below.

$$8w^3 + 125$$

6. Completely factor the expression below.

$$48m^5n - 3mn^5$$

7. Completely factor the expression below.

$$3a^3 + 2a^2 - 48a - 32$$

8. Simplify the expression below.

$$\frac{2v^4 - 128v}{6v^3 - 24v^2}$$

A. $\frac{v-16}{3v}$ **C.** $\frac{v^2+4v+16}{3v}$

B. $\frac{3v}{v^2-4v-16}$ **D.** $\frac{v^2-4v+16}{3v}$

9. Simplify the expression below.

$$\frac{p^2 - 3p - 28}{5p + 20} \cdot \frac{10p^2}{49 - p^2}$$

A. $-2p(p+7)$ **C.** $-\frac{1}{2p(p+7)}$

B. $-\frac{2p^2}{p+7}$ **D.** $\frac{2p^2}{p+7}$

10. Simplify the expression below.

$$\frac{3r - 5}{4r^2 - 4r + 1} \div \frac{6r^2 - 7r - 5}{4r^2 - 1}$$

A. $2r-1$ **C.** 1

B. $\frac{1}{2r-1}$ **D.** $\frac{2r+1}{2r-1}$

11. Simplify the expression below.

$$\frac{2n}{n+1} + \frac{n-3}{n^2-1} - \frac{7}{n-1}$$

A. $\frac{2(n-5)}{n-1}$ **C.** $\frac{2(n+5)}{n+1}$

B. $2(n-5)(n-1)$ **D.** $\frac{2}{(n-5)(n+1)}$

12. Simplify the expression below.

$$\frac{\frac{1}{21k^3} - \frac{3}{7k}}{1 - \frac{1}{3k}}$$

A. $\frac{7k^2}{3k+1}$ **C.** $\frac{3k-1}{7k^2}$

B. $\frac{-7k^2}{3k+1}$ **D.** $\frac{-(3k+1)}{7k^2}$

13. Simplify the expression below.

$$2\sqrt{128} + 4\sqrt{20} - 2\sqrt{50}$$

A. $14\sqrt{7}$

B. $4\sqrt{5} + 6\sqrt{2}$

C. $8\sqrt{5} - 6\sqrt{2}$

D. $8\sqrt{5} + 6\sqrt{2}$

14. Simplify the expression below.

$$\sqrt[3]{-15v^5} \cdot \sqrt[3]{9v^3}$$

A. $-3v^3\sqrt[3]{5v}$

B. $-3v^2\sqrt[3]{5v^2}$

C. $-3v^5\sqrt[3]{5}$

D. $-5v^2\sqrt[3]{3v^2}$

15. Simplify the expression below.

$$4\sqrt{3}\left(\sqrt{6} - \sqrt{2}\right)^2$$

A. $32\sqrt{3}$

B. $32\sqrt{3} - 48$

C. $160\sqrt{3} - 48$

D. $8\sqrt{3}$

16. Simplify the expression below.

$$\frac{\sqrt[4]{240a^{22}}}{\sqrt[4]{3a^7}}$$

A. $2\sqrt[4]{5a^3}$

B. $4\sqrt[4]{5a^3}$

C. $2a^3\sqrt[4]{5a^3}$

D. $4a^3\sqrt[4]{5a^3}$

17. Simplify the expression below.

$$\frac{-6\sqrt{32}}{3\sqrt{3}}$$

A. $-4\sqrt{6}$

B. $-\frac{2\sqrt{6}}{3}$

C. $-8\sqrt{2}$

D. $-\frac{8\sqrt{6}}{3}$

18. Simplify the expression below.

$$\frac{4\sqrt{5}}{\sqrt{10} - \sqrt{12}}$$

A. $-10\sqrt{2} - 4\sqrt{15}$

B. $10\sqrt{2} - 4\sqrt{15}$

C. $-8\sqrt{5} - 2\sqrt{15}$

D. $-14\sqrt{17}$

19. Write the expression below in exponential form.

$$\sqrt[3]{15k^4}$$

A. $(15k)^{\frac{3}{4}}$

B. $(15k)^{\frac{4}{3}}$

C. $15^{\frac{1}{3}} \cdot k^{\frac{4}{3}}$

D. $15^3 \cdot k^{\frac{3}{4}}$

20. Simplify the expression below. Write your answer in simplest radical form.

$$\frac{w^{-\frac{1}{6}} \cdot w^{\frac{8}{3}}}{w^{-1}}$$

A. $w\sqrt{w}$

B. $\sqrt[3]{w^2}$

C. $w^6\sqrt{w}$

D. $w^3\sqrt{w}$

21. Simplify the expression below.

$$(i^6)^2 \cdot 5i^7$$

A. -5

B. $-5i$

C. 5

D. $5i$

22. Simplify the expression below.

$$(8-2i)(-6+4i)-(-10-7i)$$

A. $-30+37i$

B. $-30+51i$

C. $-50+37i$

D. $-50+51i$

23. Simplify the expression below.

$$\frac{-8+5i}{3i}$$

A. $\frac{8+5i}{9}$ **C.** $\frac{5+8i}{3}$

B. $\frac{8-5i}{9}$ **D.** $\frac{5-8i}{3}$

24. Simplify the expression below.

$$\frac{2i}{(3-i)^2}$$

A. $\frac{-8+6i}{5}$ **C.** $\frac{-3+4i}{25}$

B. $\frac{-6+8i}{5}$ **D.** $\frac{-4+3i}{25}$

25. Solve the equation below.

$$-\frac{9}{4}\left(8k-\frac{16}{3}\right)+17=5-12k$$

$k =$

26. Solve the equation below.

$$8-(20-4c)=4(c-3)$$

$c =$

27. Solve the equation below for a.

$$12a^2+5b=8b$$

A. $\frac{\sqrt{b}}{2}$ **C.** $\frac{\sqrt{3b}}{12}$

B. $\frac{\sqrt{2b}}{2}$ **D.** $\frac{\sqrt{3b}}{4}$

28. Solve the equation below. Check for extraneous solutions.

$$|6-2x|-10=-2$$

$x =$

29. Solve the equation below. Check for extraneous solutions.

$$p - 4 = \frac{|5p - 4|}{3}$$

$p =$

30. Solve the equation below. Give your answer(s) in simplest form.

$$12y^2 - 17y - 5 = 0$$

$y =$

31. Solve the equation below. Give your answer(s) in simplest form.

$$r^2 + 15r + 50 = 6 - r$$

$r =$

32. Solve the equation below. Give your answer(s) in simplest form.

$$\frac{1}{3}v^2 + 27 = 12$$

$v =$

33. Solve the equation below. Give your answer(s) in simplest form.

$$5n^2 = 12n - 8$$

$n =$

34. Standing from the top of a platform, Frank shot an arrow vertically into the air at an initial velocity of 118 ft/s. The height of the arrow, h, at t seconds is modeled by the equation $h = -16t^2 + 118t + 15$. How many seconds will it take the arrow to reach the ground?

$t =$

35. Solve the equation below. Check for extraneous solutions.

$$\frac{2x-1}{x-5}=\frac{x-2}{x+3}$$

$x =$

36. Solve the equation below. Check for extraneous solutions.

$$\frac{1}{2}-\frac{2m^2+6m+4}{m^2}=\frac{1}{2m^2}$$

$m =$

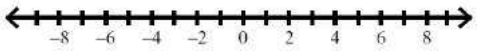
37. Solve the equation below. Check for extraneous solutions.

$$1+\frac{3}{c^2-11c+30}=\frac{3}{c-6}$$

$c =$

38. Solve the inequality below and graph the solution. Then, write the solution in interval notation.

$$-2(4v-9)\le 2(6-v)$$



39. Which of the following represents the solution to the inequality below?

$$|2y-4|>6$$

*Please omit multiple choice, and answer in any format.

A. (–5, 1)

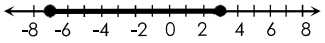
B. (–1, 5)

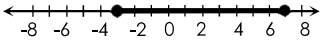
C. $(-\infty,-1)\cup(5,\infty)$

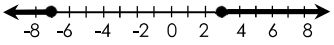
D. $(-\infty,-5)\cup(1,\infty)$

40. Which of the following graphs represents the solution to the inequality below?

$$9|2-k|+8\le 53$$

A. 

B. 

C. 

D.