Study guide Unit 2 - Equations and inequalities - 1st block sem1 2015-2016

Name: _____   **Date:** _____

1. Which of the following equations could be used to solve this problem?

    The product of two consecutive integers is 132.

    (A) $n + (n + 1) = 132$ (B) $2n + 1 = 132$

    (C) $n(n + 1) = 132$ (D) $n(n + 2) = 132$

2. The length of a rectangle is 12 more than the width. The area is 325. Which equation best represents the situation if W represents the width of the rectangle?

    (A) $w^2 + 325w + 12 = 0$

    (B) $w^2 - 12w - 325 = 0$

    (C) $w^2 + 12w - 325 = 0$

    (D) $w^2 - 325w + 12 = 0$

3. Twelve more than a number x is less than three times the number. Which of the following inequalities best represents this information?

    (A) $12 + x > 3x$ (B) $x + 12 < 3x$

    (C) $12x < 3x$ (D) $x + 12 > 3x$

4. Translate into an equation.

    An ice cube with a surface area of $60\,\text{in.}^2$ is placed in the sun. As it melts, it loses 15% of its surface area each minute. Let y be the surface area of the ice cube x minutes after it is placed in the sun.

    (A) $x = 12(1 + 0.6)^y$ (B) $y = 60(1 - 0.15)^x$

    (C) $x = 60(1 - 0.15)^y$ (D) $y = x(1 - 0.15)^{60}$

5. On January 1, 1934, George Orwell deposited $30 in a bank that paid 4% interest compounded annually. How much money was in that account on January 1, 1984?

    (A) $90.00   (B) $151.88

    (C) $162.17   (D) $213.20

6. Solve the formula $E = I(R + r)$ for r.

    (A) $r = EIR$ (B) $r = EI - R$

    (C) $r = \dfrac{E - IR}{I}$ (D) $r = \dfrac{ER}{I}$

7. Given the formula $S = \frac{1}{2}n(a + \ell)$, solve for n.

    (A) $n = \dfrac{2s}{a + \ell}$ (B) $n = S - \dfrac{a + \ell}{2}$

    (C) $n = 2S - (a + \ell)$ (D) $n = S + 2(a + \ell)$

8. $\dfrac{x^{2a}}{x^{2b}}$ is equivalent to which expression?

    (A) x^{2a+2b} (B) x^{2a-2b} (C) x^{4ab} (D) $x^{a/b}$

9. $x^a \cdot x^b$ is equivalent to which expression?

    (A) x^{a+b} (B) x^{ab} (C) $x^{a/b}$ (D) x^{a^b}

10. Which of the following is *never* true, given m and n are positive integers greater than 0?

    (A) $x^m x^n = x^{\frac{m}{n}}$ (B) $x^{\frac{m}{n}} = x^{m-n}$

    (C) $(x^m)^{-n} = \dfrac{1}{x^{mn}}$ (D) $(x^m)^n = x^{mn}$

11. When is $\left(\dfrac{4}{5}\right)^m = 1$ a true statement?

    (A)   when $m > 0$ (B)   when $m < 0$

    (C)   when $m = 0$ (D)   never

12. Solve: $\sqrt{2x} = 6$

    (A)   6   (B)   18   (C)   36   (D)   Ø

13. Solve: $\sqrt{2x} + 7 = 11$

    (A)   2   (B) $5\frac{4}{5}$ (C)   8   (D)   Ø

14. Solve: $\dfrac{1}{20} = \dfrac{\sqrt{b}}{5}$

    (A) $\frac{1}{4}$ (B) $\frac{5}{16}$ (C) $\frac{1}{20}$ (D) $\frac{1}{16}$

15. Solve: $\sqrt{8x + 8} = 4$

    (A)   0   (B)   1   (C)   2   (D)   8

16. Solve: $\dfrac{3}{x+1} + \dfrac{4}{x+2} = 2$

    (A) $-\frac{3}{2}$, 2   (B) $-\frac{8}{7}$ (C) -1, 3   (D) -3, 1

17. Solve: $\dfrac{3}{x-3} - \dfrac{4}{x+2} = -4$

    (A) -1, $\frac{3}{2}$ (B) $-\frac{1}{2}$, 3   (C)   22   (D) $-\frac{3}{4}$, 2

18. Solve the equation: $\dfrac{3}{2x-1} = \dfrac{1}{3x-5}$

19. Which is equivalent to $125^{\frac{1}{3}}$?

    (A) $\sqrt[3]{125}$ (B) $\dfrac{1}{125^3}$

    (C) $\dfrac{1}{125^{-3}}$ (D) $\dfrac{125}{125^3}$

20. Write $\sqrt[5]{7^2}$ in exponential form.

    (A) $7^{2/5}$ (B) $7^{5/2}$ (C) 7^{10} (D) 5^{49}

21. Write $x^{3/5}$ in radical form.

    (A) $\sqrt{x^{5/3}}$ (B) $(\sqrt{x})^{5/3}$

    (C) $\sqrt[3]{x^5}$ (D) $\sqrt[5]{x^3}$

22. Write $\sqrt[4]{8^3}$ in exponential form.

    (A) $3^{1/2}$ (B) $8^{4/3}$ (C) $8^{3/4}$ (D) 8^{12}
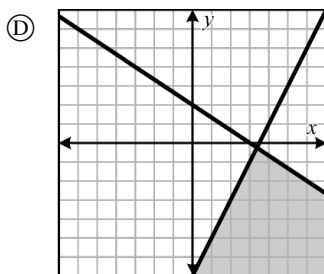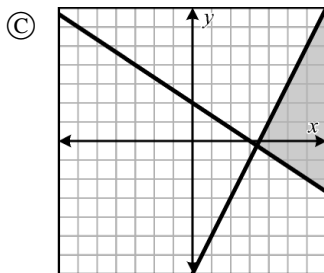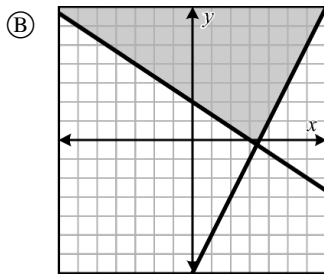
23. Find: $36^{-\frac{1}{2}}$
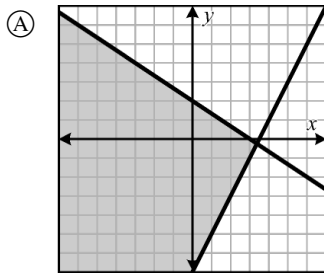
    (A) -6 (B) $\frac{1}{6}$ (C) $\frac{1}{72}$ (D) $\frac{1}{18}$

24. Evaluate: $(64)^{-2/3}$

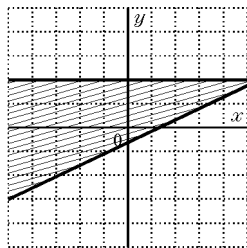   (A) -16 (B) $-\frac{1}{16}$ (C) $\frac{1}{16}$ (D)   16.2

25. Which graph shows the solution to the following system of inequalities?

$$3y + 2x \geq 6$$
$$2x - y \leq 7$$

Ⓐ

Ⓑ

Ⓒ

Ⓓ

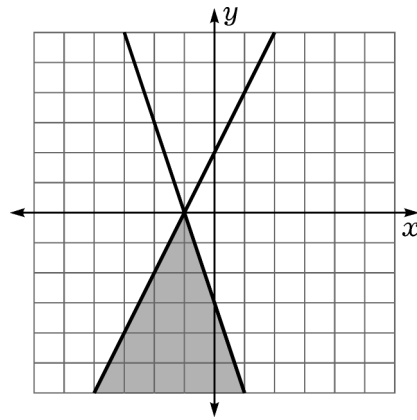26. Match the system with the given graph.

Ⓐ $\quad x + 2y \geq -2$
$\qquad\quad y \leq 2$

Ⓑ $\quad x + 2y \geq 2$
$\qquad\quad x + 0y \leq 2$

Ⓒ $\quad x - 2y \leq 1$
$\qquad\quad 0x + y \leq 2$

Ⓓ $\quad 2x - y \leq -2$
$\qquad\quad y \leq 2$

27.

The correct system for the graph is:

Ⓐ $\quad 3x - y \geq -3$
$\qquad\quad 2x + y \geq -2$

Ⓑ $\quad 3x - y \leq 2$
$\qquad\quad 2x - y \geq 2$

Ⓒ $\quad 3x - y \geq -3$
$\qquad\quad 2x + y \geq -2$

Ⓓ $\quad 3x + y \leq -3$
$\qquad\quad 2x - y \geq -2$

28. The population of Centerville has grown from 1000 in 1965 as defined by the formula

$$P = 1000 \left(2^t\right)$$

where P is the total population and t is the number of years that have passed. What was the population of Centerville in 1970?

Ⓐ 3,200

Ⓑ 16,000

Ⓒ 20,000

Ⓓ 32,000

29. Jack deposits $400 into an account that earns 7% interest compounded yearly. The amount in his account, A, is given by the equation

$$A = 400(1 + 0.07)^t$$

where t is the number of years the money has remained in the account. How much to the nearest dollar will Jack have at the end of the fifth year?

Ⓐ $457   Ⓑ $553   Ⓒ $561   Ⓓ $596

30. The formula for exponential decay is $y = a(1 - r)^t$, where a is the initial amount r is the rate of decay and t is the number of intervals. Use the formula to determine the answer to the following problem.

On Monday, your teacher gives you a list of twenty square roots to be memorized. You memorize all of them Monday night and do not look at the list again. If you forget 3% of the list each day, how many square roots will you remember three days later?

(A) 16   (B) 17   (C) 18   (D) 20

31. Solve for x: $\log_5 x = 3$

(A) $-\frac{5}{3}$ (B) $\frac{3}{5}$ (C) 125   (D) 15

32. Solve for x: $\log_2 x = 5$

(A) $\frac{5}{2}$ (B) 10   (C) 25   (D) 32

33. Evaluate: $\log_3 \left(\frac{1}{243} \right)$

(A) -5 (B) 9   (C) 27   (D) 5

34. If $y = 10^x$, then:

(A) $y = \log_x 10$ (B) $y = \log_{10} x$

(C) $x = \log_{10} y$ (D) $x = \log_y 10$

35. What is the equation of the inverse of the exponential function $y = 4^x$?

(A) $y = \log_4 x$ (B) $x = \log_4 y$

(C) $y = \log_x 4$ (D) $y = \log_{\frac{1}{4}} x$