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

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Name: _____ **Date:** _____

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

   The product of two consecutive integers is 132.

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

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

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?

   Ⓐ $w^2 + 325w + 12 = 0$

   Ⓑ $w^2 - 12w - 325 = 0$

   Ⓒ $w^2 + 12w - 325 = 0$

   Ⓓ $w^2 - 325w + 12 = 0$

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

   Ⓐ $12 + x > 3x$ Ⓑ $x + 12 < 3x$

   Ⓒ $12x < 3x$ Ⓓ $x + 12 > 3x$

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.

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

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

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?

   Ⓐ \$90.00 Ⓑ \$151.88

   Ⓒ \$162.17 Ⓓ \$213.20

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

   Ⓐ $r = EIR$ Ⓑ $r = EI - R$

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

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

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

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

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

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

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

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

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

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

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

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

Ⓐ when $m > 0$ Ⓑ when $m < 0$

Ⓒ when $m = 0$ Ⓓ never

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

Ⓐ 6 Ⓑ 18 Ⓒ 36 Ⓓ Ø

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

Ⓐ 2 Ⓑ $5\frac{4}{5}$ Ⓒ 8 Ⓓ Ø

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

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

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

Ⓐ 0 Ⓑ 1 Ⓒ 2 Ⓓ 8

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

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

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

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

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

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

Ⓐ $\sqrt[3]{125}$ Ⓑ $\frac{1}{125^3}$

Ⓒ $\frac{1}{125^{-3}}$ Ⓓ $\frac{125}{125^3}$

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

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

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

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

Ⓒ $\sqrt[3]{x^5}$ Ⓓ $\sqrt[5]{x^3}$

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

Ⓐ $3^{1/2}$ Ⓑ $8^{4/3}$ Ⓒ $8^{3/4}$ Ⓓ 8^{12}

23. Find: $36^{-\frac{1}{2}}$

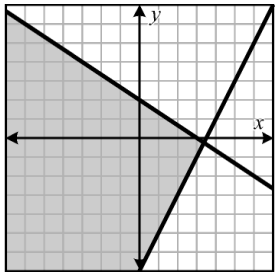
Ⓐ -6 Ⓑ $\frac{1}{6}$ Ⓒ $\frac{1}{72}$ Ⓓ $\frac{1}{18}$

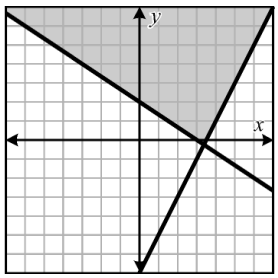
24. Evaluate: $(64)^{-2/3}$

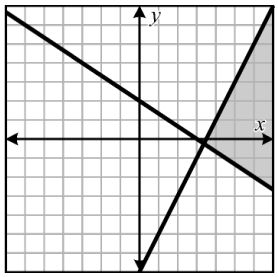
Ⓐ -16 Ⓑ $-\frac{1}{16}$ Ⓒ $\frac{1}{16}$ Ⓓ 16.2

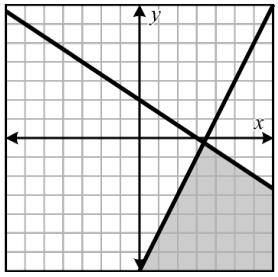
25. Which graph shows the solution to the following system of inequalities?

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

Ⓐ 

Ⓑ 

Ⓒ 

Ⓓ 

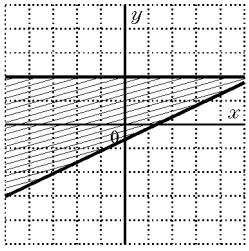
26. Match the system with the given graph.

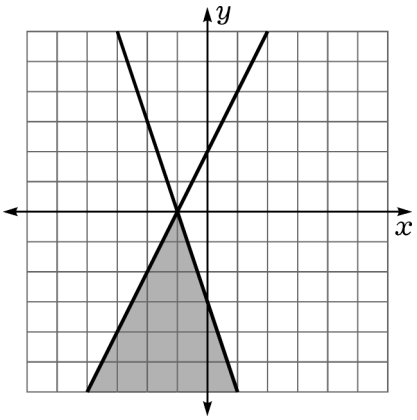
Ⓐ $x + 2y \geq -2$
$y \leq 2$

Ⓑ $x + 2y \geq 2$
$x + 0y \leq 2$

Ⓒ $x - 2y \leq 1$
$0x + y \leq 2$

Ⓓ $2x - y \leq -2$
$y \leq 2$



27. 

The correct system for the graph is:

Ⓐ $3x - y \geq -3$
$2x + y \geq -2$

Ⓑ $3x - y \leq 2$
$2x - y \geq 2$

Ⓒ $3x - y \geq -3$
$2x + y \geq -2$

Ⓓ $3x + y \leq -3$
$2x - y \geq -2$

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?

Ⓐ 16 Ⓑ 17 Ⓒ 18 Ⓓ 20

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

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

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

Ⓐ $\frac{5}{2}$ Ⓑ 10 Ⓒ 25 Ⓓ 32

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

Ⓐ -5 Ⓑ 9 Ⓒ 27 Ⓓ 5

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

Ⓐ $y = \log_x 10$ Ⓑ $y = \log_{10} x$

Ⓒ $x = \log_{10} y$ Ⓓ $x = \log_y 10$

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

Ⓐ $y = \log_4 x$ Ⓑ $x = \log_4 y$

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