

SOLUTION GUIDE

College Placement Exam

Name:

1. If $x = \frac{1}{5}$, then $x + \frac{2}{x} - 4 =$

- a. $-\frac{17}{5}$ **b. $\frac{31}{5}$** c. 6 d. $-\frac{31}{5}$ e. 0

$$\frac{1}{5} + \frac{2}{\frac{1}{5}} - 4 = \frac{1}{5} + \frac{5}{1} \cdot 2 - 4 = \frac{1}{5} + 10 - 4$$

$$= \frac{1}{5} + 6 = 6\frac{1}{5} = \frac{31}{5}$$

2. $\sqrt{16z^2 + 9z^2} = \sqrt{25z^2} = 5z$

- a. $z\sqrt{5}$ b. $7z$ **c. $5z$** d. $25z$ e. $25z^4$

3. Simplify $\frac{x+5}{x^2-4} \cdot \frac{6x+12}{2x+10}$

- a. $\frac{3}{x+2}$ b. $\frac{3}{x}$ c. $\frac{1}{x}$

d. $\frac{3}{x-2}$

e. $\frac{7x+17}{x^2+2x+6}$

$$\frac{(x+5)(\cancel{6})(x+2)}{(x+2)(x-2)(2)(x+5)}$$

$$= \frac{\overset{1}{(x+5)} \overset{3}{(\cancel{6})} \overset{1}{(x+2)}}{\overset{1}{(x+2)} \overset{1}{(x-2)} \overset{1}{(2)} \overset{1}{(x+5)}}$$

$$= \frac{3}{x-2}$$

4. $f(x) = 2x + 3$ and $g(x) = x^2 + 2$, then $g(f(3)) =$

- a. 25 b. 21 c. 17 d. 123 **e. 83**

$$f(3) = 2(3) + 3 = 9$$

$$g(9) = 9^2 + 2 = 83$$

5. The distance between the points (4, 2) and (-3, -5) is:

- a. $2\sqrt{7}$ b. $49\sqrt{2}$ **c. $7\sqrt{2}$** d. 98 e. $\sqrt{10}$

$$d^2 = (\Delta y)^2 + (\Delta x)^2$$

$$d^2 = (y - y_1)^2 + (x - x_1)^2$$

$$d^2 = (2 - (-5))^2 + (4 - (-3))^2$$

$$d^2 = (7)^2 + (7)^2$$

$$d^2 = 98$$

$$d = \sqrt{98} = \sqrt{49 \cdot 2} = 7\sqrt{2}$$

6. Find the domain of $f(x)$

$$f(x) = \frac{\sqrt{x+4}}{x-5} \rightarrow \sqrt{x+4} \rightarrow x+4 \rightarrow \text{NON-NEGATIVE}$$

$x+4 \geq 0$
 $x \geq -4$

$x-5 \neq 0$
 $x \neq 5$

- a. $\{x|x \neq 5\}$ b. $\{x|x \neq 4\}$ c. $\{x|x \geq 5\}$

- d. $\{x|x \geq 4 \text{ and } x \neq 5\}$ **e. $\{x|x > 4 \text{ and } x \neq 5\}$**

7. For all $x \neq \pm 3$, $\frac{x^2 - 4x - 21}{x^2 - 9} = \frac{(x-7)(x+3)}{(x+3)(x-3)}$

- a. $\frac{x-7}{x-3}$ b. $\frac{-4x-21}{-9}$ c. $\frac{x-7}{x+3}$
 d. $\frac{x-3}{x-7}$ e. $\frac{21}{9}$

8. Write in a+bi form $\frac{8+4i}{1+i}$

- a. $6-2i$ b. $2-2i$ c. $6+2i$ d. $2+2i$ e. $4-2i$

$$\frac{8+4i}{1+i} \cdot \frac{1-i}{1-i} = \frac{8-8i+4i-4i^2}{1+i-i-i^2}$$

$$= \frac{8-4i-4i^2}{1-i^2} = \frac{8-4i-4(-1)}{1-(-1)} = \frac{12-4i}{2} = 6-2i$$

9. Find the solution $x^2 - 3x - 10 > 0$

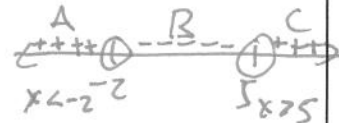
- a. $\{x | -2 < x < 5\}$
 b. $\{x | 2 < x < 5\}$
 c. $\{x | x < -2 \text{ or } x > 5\}$
 d. $\{x | x \leq -2 \text{ or } x \geq 5\}$
 e. $\{x | x < -5 \text{ or } x > 2\}$

FIND ROOTS

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

$$x-5=0 \quad x+2=0$$

$$x=5 \quad x=-2$$



TEST A $x^2 - 3x - 10 > 0$

yes $x = -3$ $(-3)^2 - 3(-3) - 10 = 8$

no $x = 0$ $(0)^2 - 3(0) - 10 = -10$

yes $x = 6$ $(6)^2 - 3(6) - 10 = 8$

10. Solve for x. $\log_{10} x = -4$

- a. 10000 b. 100000 c. $\frac{1}{100000}$ d. $\frac{1}{10000}$ e. -10000

$$10^{-4} = x$$

$$\frac{1}{10^4} = x$$

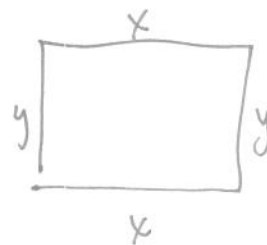
$$\frac{1}{10000} = x$$

11. A rectangular field with length x and width y is surrounded by a fence 400 feet long. Express the area of the field in terms of y .

a. $A = 250x - x^2$ b. $A = 500y - 2y^2$

c. $A = 500y^2$ d. $A = 500 - y^2$

e. $A = 250y - y^2$



$$2x + 2y = 500$$

$$2x = 500 - 2y$$

$$x = 250 - y$$

$$A = xy$$

$$A = (250 - y)y$$

$$A = 250y - y^2$$

12. You have a total of 21 coins in your pocket, all nickels and dimes. The total value of the coins is \$1.70. How many of the coins are nickels?

- a. 13
 b. 17
 c. 34
 d. 8
 e. 21

$$N + D = 21$$

$$.05N + .10D = 1.70$$

$$D = 21 - N$$

$$.05N + .10(21 - N) = 1.70$$

$$.05N + 2.10 - .10N = 1.70$$

$$-.05N = -.40$$

$$N = 8$$