

COMPASS Review

- ① Spend a lot of time on first few questions.
- ② OK to guess → choose one letter (B or C) to use as answer for ones you don't know.

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- ③ Average 10-20 questions
- ④ 37 or higher to pass
- ⑤ Everyone gets a retest.
- ⑥ Covers 97 & 98 material.
- ⑦ Can't go back


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Formulas:

① Distance formula

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

② Midpoint formula Average

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$


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③ Slope of a line

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad \frac{\text{rise}}{\text{run}}$$

④ Quadratic Formula

$$ax^2 + bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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$$\textcircled{5} \quad X^{m/n} = \left(\sqrt[n]{X} \right)^m$$

$$8^{-2/3} = \frac{1}{8^{2/3}} = \frac{1}{4} \quad 8^{2/3} = \left(\sqrt[3]{8} \right)^2 = 2^2 = 4$$

$\textcircled{6}$ Properties of Exponents

$$a^{-n} = \frac{1}{a^n} \quad a^m \cdot a^n = a^{m+n}$$

$$(ab)^m = a^m b^m \quad (a^m)^n = a^{mn}$$

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$$\frac{a^m}{a^n} = a^{m-n}$$

$\textcircled{7}$ Square Binomial

$$(x+2)^2 = x^2 + 4x + 4$$

$$(x+2)(x+2)$$

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⑧ Complete the Square:

$$x^2 + 8x + 16 = (x+4)(x+4)$$

$$\left(\frac{8}{2}\right)^2 = (4)^2 = 16$$

⑨ Order of Operations

PEMDAS
left → right

Parentheses
Exponents
Mult / Div.
Add / Subt.

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Andrea Hendricks

1) The solution to $2x + 3 = 8$ falls between what two consecutive integers?

A) 1 and 2

B) 2 and 3

C) 3 and 4

2) $(\sqrt{6} - 6)(\sqrt{3} + 4) = \sqrt{18} + 4\sqrt{6} - 6\sqrt{3} - 24$

A) $3\sqrt{2} - 24$

B) $-3\sqrt{2} - 24$

C) $3\sqrt{2} - 2\sqrt{3} - 24$

$$3\sqrt{2} + 4\sqrt{6} - 6\sqrt{3} - 24$$

D) $3\sqrt{2} + 4\sqrt{6}$

3) The ratio 10 to y is 15 to 20. Find y.

A) 3

B) 40

$$\frac{10}{y} = \frac{15}{20}$$

$$15y = 200 \\ y = \frac{200}{15} = \frac{40}{3}$$

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The solution to the equation $5^x = 7$ satisfies which of the following statements.

A) $x < 1$ $5^0 = 1$ B) $1 < x < 2$ C) $2 < x < 3$
 $5^1 = 5$ $5^2 = 25$

Given the following table, find the relationship between p and t .

t	0	10	20	30
p	50	70	90	110

$m = \frac{\Delta y}{\Delta x} = \frac{70 - 50}{10 - 0} = \frac{20}{10} = 2$

$y = mx + b \rightarrow y = 2x + 50 \rightarrow p = 2t + 50$

A) $p = 50 + 2t$ B) $p = 50 + \frac{1}{2}t$ C) $p = 50t + 2$

Handwritten notes: "equation?", "t | p", and a table with values (0|50), (10|70), (20|90), (30|110).

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To graph a line begin at $(3, 4)$ and then move down 2 and right 1 to get to next point. What is slope of line?

$m = \frac{\text{rise}}{\text{run}} = \frac{-2}{1} = -2$

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The slope of $4x - 2y + 8 = 0$ is

A) -4 B) 4 C) -2

$4x + 8 = 2y$ $2x + 4 = y$ $m = 2$

The solution to the system containing the equations $x + y = 12$ and $x - y = -4$ is

A) $\{(4, 8)\}$ B) $\{(3, 9)\}$ C) $\{(-4, 9)\}$

$x + y = 12$
 $x - y = -4$
 $2x = 8$
 $x = 4$
 $4 + y = 12$
 $y = 8$

The slope of a line is 2 and the y-intercept is 4. What is the x-intercept?

A) -2 B) 2 C) -4

$y - 4 = 2(x - 0)$
 $y - 4 = 2x$
 $y = 2x + 4$
 $0 = 2x + 4$
 $-4 = 2x$
 $-2 = x$

The solution to $6x - 5(x - 1) = 2$ is

A) $\{1\}$ B) $\{\frac{1}{11}\}$ C) $\{-1\}$

$6x - 5x + 1 = 2$
 $x + 1 = 2$
 $x = 1$
 $6x(5x - 1) = 2$

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Address: <http://www.gpc.edu/~ahendric/Math0098/COMPASSreview.pdf>

Pages: 2 of 7

Attachments: Unknown Zone

Comments: Unknown Zone

Handwritten notes on the PDF:

Points: $(-2, -1)$ and $(3, 2)$

Slope calculations:

$$m = \frac{3}{5}$$

$$m = \frac{2 - (-1)}{3 - (-2)} = \frac{3}{5}$$

Options:

A) $-\frac{3}{5}$ B) $\frac{3}{5}$ C) $-\frac{5}{3}$

Question: If $2x + 4y + k = 0$ and $x = 3$ is a solution, what is k ?

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If $x^2 + 4x + k = 0$ and $x = 3$ is a solution, what is k ?

A) -18

B) 18

C) -21

$$(3)^2 + 4(3) + k = 0$$
$$9 + 12 + k = 0$$

2

$$21 + k = 0$$
$$k = -21$$

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The point (x, y) that is the midpoint of the line segment $(2, 4)$ and $(-6, 2)$ is

A) $(-2, 3)$

B) $(3, -2)$

C) $(4, 1)$

$$m = \left(\frac{2 + (-6)}{2}, \frac{4 + 2}{2} \right) = \left(\frac{-4}{2}, \frac{6}{2} \right)$$

The y-intercept of $x + 2y = 8$ is

A) 8

B) 4

C) 2

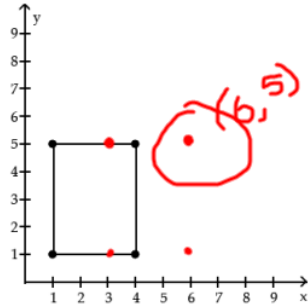
$$x=0: 0 + 2y = 8$$

$$y = 4$$

$$= (-2, 3)$$

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22) The rectangle below has vertices of (1, 1), (4, 1), (1, 5), and (4, 5). The rectangle is translated so that three of the new vertices are (3, 1), (6, 1) and (3, 5). What are the coordinates of the other vertex?



Translated means shifted (left, right, up, or down).

A) (4, 5)

B) (5, 5)

C) (6, 5)

D) (7, 5)

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23) Find x if $\frac{2x}{3} = \frac{16}{x}$.

A) $\pm 6\sqrt{2}$

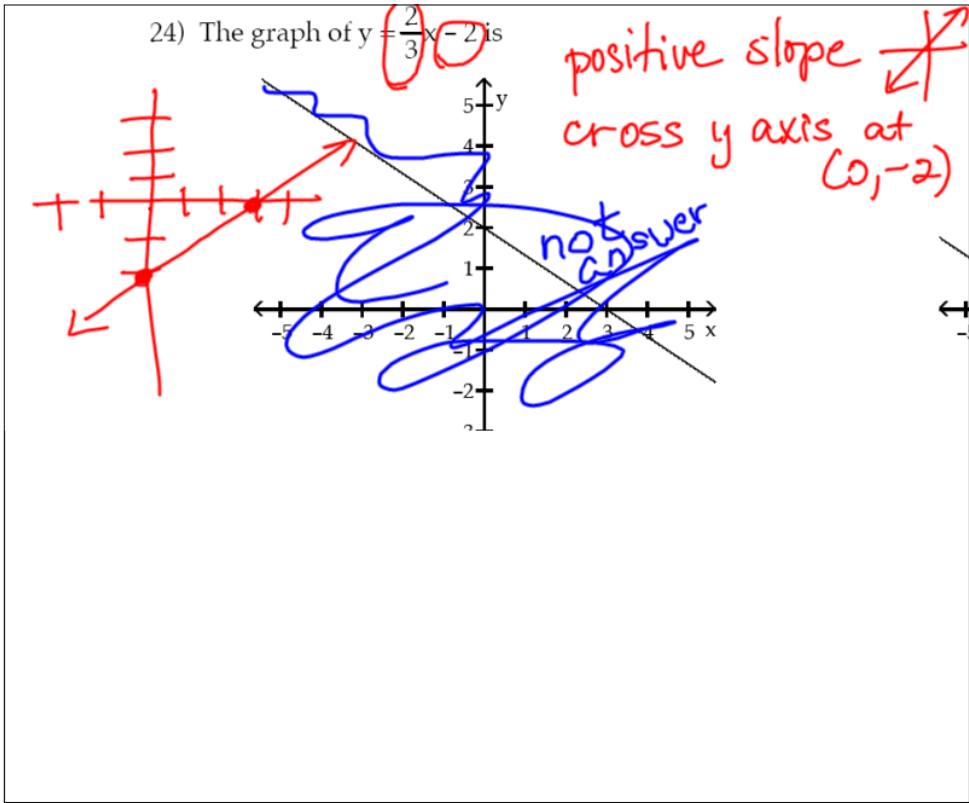
B) $\pm 2\sqrt{6}$

$$\frac{2x^2}{2} = \frac{48}{2}$$

$$x^2 = 24$$

$$x = \pm \sqrt{24} = \pm 2\sqrt{6}$$

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26) $(2x + 1)(3x - 4) - (6x^2 + x - 3) = 6x^2 - 8x + 3x - 4 - 6x^2 - x + 3$

A) $-6x - 7$ B) $-6x - 1$ C) $-4x - 7$

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31) If $-3 = \frac{-45}{\sqrt{x^2 - 1}}$, what is the value of x^2 ?

A) $\pm\sqrt{226}$

B) $\pm\sqrt{224}$

C) 226

D) 224

$$-3\sqrt{x^2 - 1} = -45$$

$$\sqrt{x^2 - 1} = 15$$

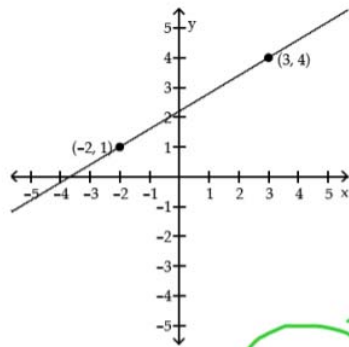
$$(\sqrt{x^2 - 1})^2 = 15^2$$

$$x^2 - 1 = 225$$

$$x^2 = 226$$

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33) Find an estimate for the distance between the points on the axes below.



$$\begin{aligned} d &= \sqrt{(3 - (-2))^2 + (4 - 1)^2} \\ &= \sqrt{5^2 + 3^2} \\ &= \sqrt{25 + 9} \\ &= \sqrt{34} \end{aligned}$$

Since you need to estimate the square root of 34, think of two numbers that are perfect squares close to 34. You know that square root of 25 = 5 and the square root of 36 = 6, so the square root of 34 is between 5 & 6, closer to the 6.

A) 4.3

B) 5.8

C) 26

D) 34

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39) For $x \neq -1$, $\frac{(3x+6)-3}{6x+6}$

A) 2

B) $\frac{1}{2}$

C) 3

D) $\frac{1}{3}$

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

Combine like terms in the numerator.

Factor the numerator and denominator.

Divide out the common factors.

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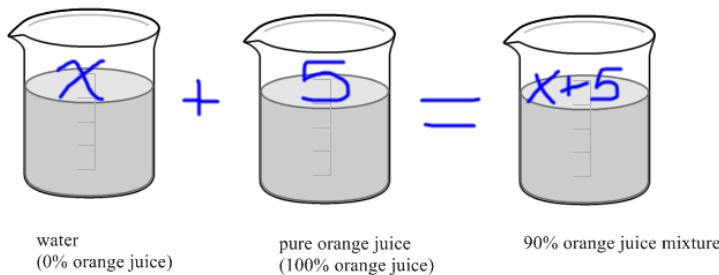
41) How much water should be added to 5 gallons of pure orange juice to make an orange juice mixture that is 90% juice?

A) 1/10 gallons

B) 5/9 gallons

C) 1 gallon

D) 5 gallons



$$\begin{aligned} 0x + 1(5) &= .9(x + 5) \\ 5 &= .9x + 4.5 \\ 50 &= 9x + 45 \\ 5 &= 9x \\ 5/9 &= x \end{aligned}$$

Multiply percent* amount.
Clear parentheses.
Multiply by 10 to remove decimals.
Solve for x.

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- 47) If $x = 4$ and $y = kx + 2x$, then $y = 9$. What is the value of y when $x = 2$?
 A) $5/2$ B) $7/2$ C) $9/2$ D) $11/2$
- 48) The solution to $3 - 2x < 5$ is
 A) $x > -1$ B) $x < -1$ C) $x > 1$ D) $x < 1$
- 49) If $m = -3$ and $n = 2$, the value of $5(m + n)(m - n)$ is
 A) -5 B) 5 C) -25 D) 25
- 50) The value that makes the expression $\frac{x+4}{3x+6}$ undefined is
 A) no values B) -4 C) -2 D) 2
- 51) Use the rule $a \cdot b = (3a+2b)(3a-2b)$ to find $4 \cdot 1$.
 A) -24 B) 24 C) 140 D) -140

#47 First step is to solve for k . Use $x = 4$ and $y = 9$ to find k . This gives us

$$\begin{aligned} 9 &= k(4) + 2(4) \\ 9 &= 4k + 8 \\ 1 &= 4k \\ 1/4 &= k \end{aligned}$$

Now find y when $x = 2$ and $k = 1/4$.
 $y = (1/4)(2) + 2(2) = 1/2 + 4 = 1/2 + 8/2 = 9/2$

#48 Isolate x . Remember that when you divide by a negative number the inequality reverses.

$$\begin{aligned} 3 - 2x &< 5 \\ -2x &< 2 \\ \text{Divide by } -2 \text{ to get} & \\ x &> -1 \end{aligned}$$

#50 To find the values that make a rational expression undefined, find the value that makes the denominator equal to zero (division by 0 is undefined).

$$\begin{aligned} 3x + 6 &= 0 \\ 3x &= -6 \\ x &= -2 \end{aligned}$$

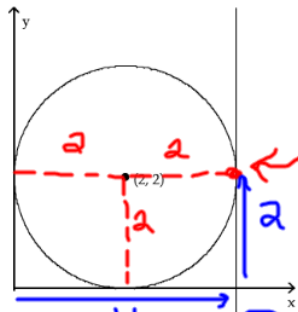
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#51 If $a \cdot b = (3a + 2b)(3a - 2b)$, to find $4 \cdot 1$ replace a with 4 and b with 1 to get

$$4 \cdot 1 = (3(4) + 2(1))(3(4) - 2(1)) = (12 + 2)(12 - 2) = (14)(10) = 140$$

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52) The line drawn is tangent to the circle with center $(2, 2)$ and radius 2 . What are the coordinates of the tangent point?



A) $(2, 4)$

B) $(4, 2)$

C) $(0, 2)$

D) $(2, 0)$

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