

Watch. Practice. Understand. | Lesson 004

2022 Algebra 1 Chapter 4 Point Slope Form, Arithmetic Sequence and Piece wise function

Watch the matching video: <https://www.youtube.com/watch?v=1bCyvMgXrrk>

Practice focus: Lines and slopes

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 Find the slope through (2, 5) and (6, 13).

02 Write the line with slope -3 through (2, 7).

03 Find the line perpendicular to $y = 2x + 1$ through (4, 3).

04 Find both intercepts of $3x + 2y = 12$.

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Practice focus: Arithmetic sequences and series

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

05 Find term 12 of 5, 8, 11,

06 Find the sum of the first 12 terms of 5, 8, 11,

07 An arithmetic sequence has $a_3 = 10$ and $a_8 = 30$. Find a_1 and d .

08 A theater has 20 seats in row 1 and 2 more per successive row. Find the total in 15 rows.

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Watch the matching video: <https://www.youtube.com/watch?v=1bCyvMgXrrk>

Practice focus: Functions, composition and piecewise rules

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

09 For $f(x) = x^2 - 3x$, find $f(-2)$.

10 If $f(x) = 2x + 1$ and $g(x) = x^2$, find $f(g(3))$ and $g(f(3))$.

11 For $f(x) = x + 2$ when $x < 1$, and $f(x) = x^2$ when $x \geq 1$, find $f(0)$, $f(1)$, $f(2)$.

12 Find the domain of $f(x) = \sqrt{(x - 2)/(x - 5)}$.

Worked answers | Lesson 004

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Practice focus: Lines and slopes

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01 Find the slope through (2, 5) and (6, 13).

$$m = (13 - 5)/(6 - 2) = 8/4 = 2.$$

02 Write the line with slope -3 through (2, 7).

$$y - 7 = -3(x - 2), \text{ or } y = -3x + 13.$$

03 Find the line perpendicular to $y = 2x + 1$ through (4, 3).

$$\text{Perpendicular slope is } -1/2. \ y - 3 = -(x - 4)/2, \text{ so } y = -x/2 + 5.$$

04 Find both intercepts of $3x + 2y = 12$.

$$\text{Set } y = 0: x = 4. \text{ Set } x = 0: y = 6. \text{ Intercepts: } (4, 0) \text{ and } (0, 6).$$

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Practice focus: Arithmetic sequences and series

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05 Find term 12 of 5, 8, 11,

$$a_n = 5 + 3(n - 1), \text{ so } a_{12} = 38.$$

06 Find the sum of the first 12 terms of 5, 8, 11,

$$S_{12} = 12(5 + 38)/2 = 258.$$

07 An arithmetic sequence has $a_3 = 10$ and $a_8 = 30$. Find a_1 and d .

$$5d = 20 \text{ gives } d = 4; a_1 + 2(4) = 10 \text{ gives } a_1 = 2.$$

08 A theater has 20 seats in row 1 and 2 more per successive row. Find the total in 15 rows.

$$\text{Last row: } 20 + 14(2) = 48. \text{ Total: } 15(20 + 48)/2 = 510 \text{ seats.}$$

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Practice focus: Functions, composition and piecewise rules

Original extra practice matched to the listed lesson topic.

09 For $f(x) = x^2 - 3x$, find $f(-2)$.

$$f(-2) = 4 + 6 = 10.$$

10 If $f(x) = 2x + 1$ and $g(x) = x^2$, find $f(g(3))$ and $g(f(3))$.

$$g(3) = 9, \text{ so } f(9) = 19. f(3) = 7, \text{ so } g(7) = 49.$$

11 For $f(x) = x + 2$ when $x < 1$, and $f(x) = x^2$ when $x \geq 1$, find $f(0)$, $f(1)$, $f(2)$.

Use the first rule at 0 and the second at 1 and 2: 2, 1, 4.

12 Find the domain of $f(x) = \sqrt{(x - 2)/(x - 5)}$.

Require $x \geq 2$ for the radical and $x \neq 5$ for the denominator. Domain: $[2, 5)$ union $(5, \text{infinity})$.