Unit 1B Day 1 Review Practice — Part A — Key

Functions, slope, and rate of change

Directions: Show work. Questions 1–3 review prerequisite skills.

1. Evaluate $(-3)^2$. **Answer:** $(-3)^2=9$	**2.** Simplify $2(a-4)+5$. **Answer:** $2a-8+5=2a-3$	**3.** Compute $\frac{-8-4}{5-(-1)}$. **Answer:** $\frac{-12}{6}=-2$
4. Evaluate $f(-3)$. $f(x)=2x^2$ **Answer:** $f(-3)=2(-3)^2=18$	**5.** Evaluate $g(-4)$. $g(x)=3x-5$ **Answer:** $g(-4)=3(-4)-5=-17$	**6.** Evaluate $h(-6)$. $h(x)=\frac{1}{2}x+7$ **Answer:** $h(-6)=-3+7=4$
7. Simplify $p(a-8)$. $p(x)=\frac{1}{4}x+3$ **Answer:** $p(a-8)=\frac{a}{4}-2+3=\frac{a}{4}+1$	**8.** Simplify $q(b+6)$. $q(x)=\frac{1}{3}x-4$ **Answer:** $q(b+6)=\frac{b}{3}+2-4=\frac{b}{3}-2$	**9.** Simplify $r(c-2)$. $r(x)=2x+5$ **Answer:** $r(c-2)=2c-4+5=2c+1$
10. Find the slope through (−3, −2) and (3, 4). Describe the line's direction. **Answer:** $m=1$ Up to the right (increasing).	**11.** Find the slope through (−4, 5) and (2, 1). Describe the line's direction. **Answer:** $m=-\frac{2}{3}$ Down to the right (decreasing).	**12.** Find the slope through (−2, −3) and (4, 6). Describe the line's direction. **Answer:** $m=\frac{3}{2}$ Up to the right (increasing).

Unit 1B Day 1 Review Practice — Part A — Key

Functions, slope, and rate of change

Directions: Show work. Use up to the right (increasing) or down to the right (decreasing).

13. Find the slope through (−5, 4) and (3, 0). Describe the line's direction.

Answer:

$m = -\frac{1}{2}$

Down to the right (decreasing).

14. Find the slope through (2, −4) and (2, 5). Describe the line's direction.

Answer:

Undefined slope; vertical line.

15. Find the slope through (−3, 6) and (4, 6). Describe the line's direction.

Answer:

$m = 0$

Horizontal line.

16. Find the average rate of change.

$h(x) = x^2 - 3$

From $x = 1$ to $x = 4$.

Answer:

$h(1) = -2$

$h(4) = 13$

$Rate = \frac{13 - (-2)}{4 - 1} = 5$

17. Find the average rate of change.

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

From $x = 2$ to $x = 5$.

Answer:

$h(2) = 6$

$h(5) = 27$

$Rate = \frac{27 - (6)}{5 - 2} = 7$

18. Find the average rate of change.

$h(x) = x^2 - 5$

From $x = 0$ to $x = 6$.

Answer:

$h(0) = -5$

$h(6) = 31$

$Rate = \frac{31 - (-5)}{6 - 0} = 6$

19. Find the average rate of change.

Time (min): 1 4 7

Water (gal): 90 72 54

Include units and explain the sign.

Answer:

$\frac{54 - 90}{7 - 1} = -6$

−6 gallons per minute.

Water decreases 6 gallons each minute.

20. At 2 hours, a tank holds 140 gallons. At 8 hours, it holds 92 gallons. Find the average rate of change, with units. Explain the sign.

Answer:

$\frac{92 - 140}{8 - 2} = -8$

−8 gallons per hour.

Volume decreases 8 gallons per hour.

21. Find the average rate of change.

$p(x) = x^2 + 1$

From $x = 3$ to $x = 7$.

Answer:

$p(3) = 10$, $p(7) = 50$

$\frac{50 - 10}{7 - 3} = 10$