AP PRECALCULUS | TOPIC 2.2 | WORKSHEET A

Change in Linear and Exponential Functions

Name: _____ **Date:** _____ **Period:** _____

1. Classify as linear, exponential, or neither. Justify: (1, 4), (3, 2), (5, −6)

2. Classify as linear, exponential, or neither. Justify: (−1, 2), (−3, 6), (−5, 18)

3. Classify as linear, exponential, or neither. Justify: (12, 8), (13, 14), (14, 11)

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Name: _____ **Date:** _____ **Period:** _____

4. Classify the table as linear, exponential, or neither. Justify.

x	1	3	5	7	9
f(x)	3	9	27	81	243

5. Classify the table as linear, exponential, or neither. Justify.

x	2	3	4	5	6
f(x)	-2	0	3	7	12

6. Classify the table as linear, exponential, or neither. Justify.

x	4	8	12	16	20
f(x)	160	40	10	2.5	0.625

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Name: _____ Date: _____ Period: _____

7. Classify the table as linear, exponential, or neither. Justify.

x	3	7	11	15	19
f(x)	-8	-2	4	10	16

8. Identify the function type and its slope or exponential base: $y = -5 \cdot (\frac{1}{4})^x$

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Name: _____ Date: _____ Period: _____

11. Identify the function type and its slope or exponential base: $y = 3 - 5(x + 2)$

12. Write a linear equation through (3, 14) and (7, 4).

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Name: _____ Date: _____ Period: _____

13. Write a linear equation through (2, 7) and (8, 35).

14. Write an exponential equation through (3, 14) and (7, 4).

15. Write an exponential equation through (2, 7) and (8, 35).

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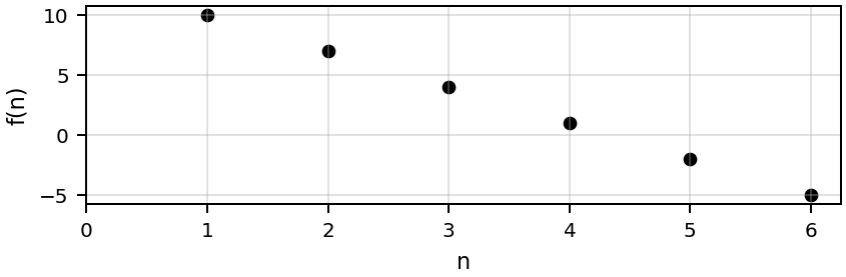
Change in Linear and Exponential Functions

Name: _____ Date: _____ Period: _____

16. Use the discrete graph to complete the table, find d, and write an explicit linear rule.



n	0	1	2	3	4	5	6
a n		10					

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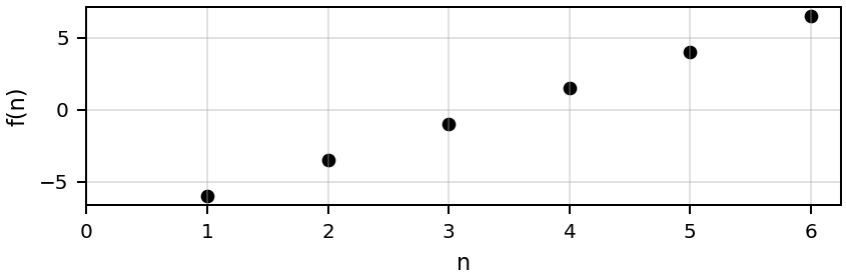
Change in Linear and Exponential Functions

Name: _____ **Date:** _____ **Period:** _____

17. Use the discrete graph to complete the table, find d, and write an explicit linear rule.



n	0	1	2	3	4	5	6
a n		-6					

a linear rule. a_7 and a_8 = 21, complete the table. State the displayed domain and range, write

n	2	3	4	5	6	7	8
a_n	-9						21

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Change in Linear and Exponential Functions

Name: _____ Date: _____ Period: _____

write a linear rule. a_7 and a_6 = 6, complete the table. State the displayed domain and range,

n	1	2	3	4	5	6
a_n	9.5					-8

20. Starting at n = 1, find d, the explicit rule, and the number of terms: 11, 5, -1, ..., -43.

21. Starting at n = 1, find d, the explicit rule, and the number of terms: -9, -4.75, -0.5, ..., 42.0.

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22. Starting at n = 1, find d, the explicit rule, and the number of terms: 2.4, -0.7, -3.8, ..., -68.9.

23. Starting at n = 1, find d, the explicit rule, and the number of terms: 5.2, 4.9, 4.6, ..., -8.9.

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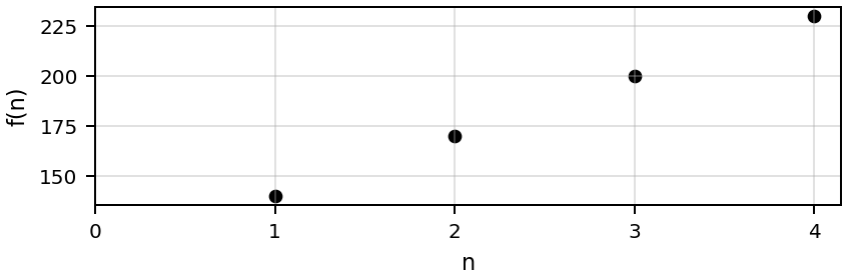
Change in Linear and Exponential Functions

Name: _____ Date: _____ Period: _____

24. The graph shows the cost of a group tour. (a) Complete the table. (b) Is it arithmetic? Explain. (c) Write f(n). (d) Interpret n and f(n).



n	1	2	3	4
f(n)				

25. Air starts at 82°F and cools 4.5°F per 1,000 feet. (a) Write $T(n)$, where n is thousands of feet. (b) Find the temperature at 11,000 feet.

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Change in Linear and Exponential Functions

Name: _____ Date: _____ Period: _____

26. An interest-free loan has balances shown after each monthly payment. (a) Write the rule. (b) Find the payoff month. (c) Find the original loan and final payment.

Month	1	2	3	4
Balance	1090	950	810	670

27. A job pays $48,000 in year 1 with annual raises of $3,000. When will cumulative salary first exceed $520,000? Find the cumulative salary then.

28. A flight simulation counts 9,600 departures at 4 AM and 21,600 at 10 AM. Assume arithmetic change. Predict total departures by 5 PM (hour 17).

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Name: _____ Date: _____ Period: _____

29. A machine produces 5,400 items after 3 hours and 14,400 after 8 hours. Assume arithmetic change. Find the total after 13 hours.

AP PRECALCULUS | TOPIC 2.2 | WORKSHEET B

Change in Linear and Exponential Functions

Name: _____ Date: _____ Period: _____

1. Classify as linear, exponential, or neither. Justify: (7, 13), (8, 8), (9, 3)

2. Classify as linear, exponential, or neither. Justify: (-3, 32), (-1, 8), (1, 2)

3. Classify as linear, exponential, or neither. Justify: (2, 7), (3, 11), (4, 16)

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Change in Linear and Exponential Functions

Name: _____ Date: _____ Period: _____

4. Classify the table as linear, exponential, or neither. Justify.

x	0	3	6	9	12
f(x)	2	10	50	250	1250

5. Classify the table as linear, exponential, or neither. Justify.

x	1	2	3	4	5
f(x)	2	4	9	16	25

6. Classify the table as linear, exponential, or neither. Justify.

x	2	6	10	14	18
f(x)	81	27	9	3	1

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Name: _____ Date: _____ Period: _____

7. Classify the table as linear, exponential, or neither. Justify.

x	4	7	10	13	16
f(x)	15	11.5	8	4.5	1

8. Identify the function type and its slope or exponential base: $y = (\frac{3}{8})\cdot 5^x$

9. Identify the function type and its slope or exponential base: $y = 4 + 7x$

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Name: _____ Date: _____ Period: _____

10. Identify the function type and its slope or exponential base: $y + 2 = 4 \cdot (\frac{5}{3})^{(x-2)}$

11. Identify the function type and its slope or exponential base: $y + 1 = 3(x - 3)$

12. Write a linear equation through (4, 11) and (7, 23).

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Change in Linear and Exponential Functions

Name: _____ Date: _____ Period: _____

13. Write a linear equation through (2, 18) and (7, 5).

14. Write an exponential equation through (4, 11) and (7, 23).

15. Write an exponential equation through (2, 18) and (7, 5).

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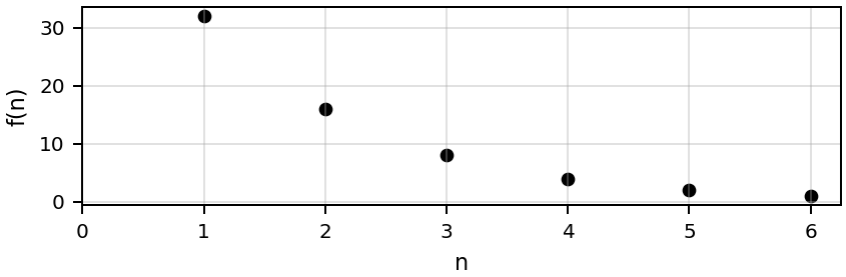
Change in Linear and Exponential Functions

Name: _____ Date: _____ Period: _____

16. Use the discrete graph to complete the table, find r, and write an exponential rule.



n	1	2	3	4	5	6
	32	16.0				

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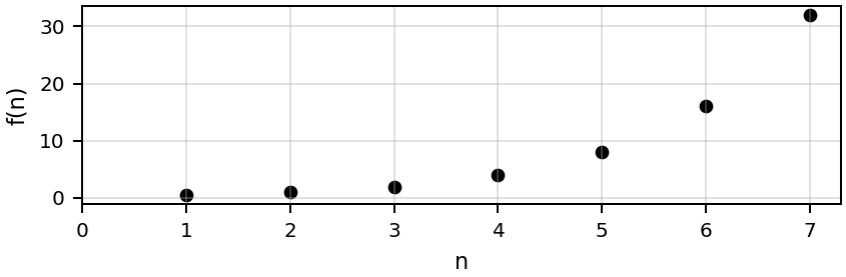
Change in Linear and Exponential Functions

Name: _____ Date: _____ Period: _____

17. Use the discrete graph to complete the table, find r, and write an exponential rule.



n	1	2	3	4	5	6	7
a_n	0.5	1.0					

Sequence: a_3 [illegible]

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Change in Linear and Exponential Functions

Name: _____ **Date:** _____ **Period:** _____

11. Given 0.5, 2.0, 8, 32, ..., write an exponential function $f(n) = ab^n$, starting at $n = 1$.

[illegible]

[illegible]

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Change in Linear and Exponential Functions

Name: _____ **Date:** _____ **Period:** _____

[illegible]

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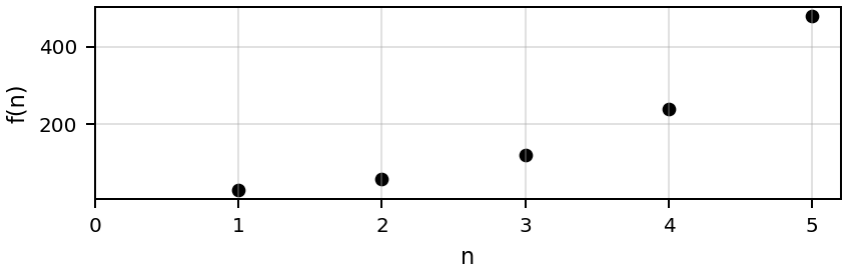
Change in Linear and Exponential Functions

Name: _____ **Date:** _____ **Period:** _____

24. The graph shows gift boxes packed each day. (a) Complete the 7-day table. (b) Explain whether geometric. (c) Write f(n). (d) Interpret n and f(n). (e) Find the total boxes for seven days.



n	1	2	3	4	5	6	7
f(n)	30	60			480		

25. A marble begins 30 inches above the bottom of a cylinder. Its height decreases by 18% each second. (a) Write h(t). (b) Find the depth sunk after 9 seconds. (c) When is it 3 inches above the bottom?

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Change in Linear and Exponential Functions

Name: _____ Date: _____ Period: _____

26. A culture initially contains 8,000 bacteria and grows 25% hourly. (a) Write N(t). (b) Estimate the population after 9 hours.

27. A ball is dropped from 32 feet and rebounds to 75% of its previous height. (a) Complete the table. (b) Write f(n). (c) Find height at bounce 9. (d) Find first bounce below 1 foot.

Bounce	1	2	3	4	5
Height					

28. A video has 1,800 views at hour 2 and 48,600 at hour 5. Assume geometric growth. Predict views at hour 8.

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Change in Linear and Exponential Functions

Name: _____ Date: _____ Period: _____

29. A wildlife population is 125 at month 2 and 512 at month 5. Assume geometric growth. Predict the population at month 10.

30. A modeled bird population was 630 nesting pairs in 1970 (year 0) and 52,000 in 2020 (year 50). Estimate the number in 2005.