

Algebra II Module 8 Lesson 13 – Solving Contextual Exponential Equations

2. The number of telecommuters, or people who spend at least part of their work day at home and who use computers or some other telecommunication equipment, has grown exponentially, since 1990, as indicated by the table below:

Years after 1990	0	1	2	3	4	5	6	7	8	9	10
# of Telecommuters (in millions)	4.3	5.4	6.5	7.2	8.5	8.7	9.2	11.1	15.6	19.4	23.5

Find an exponential model that fits the data and use your model to predict the number of telecommuters in the year 2020. Round your answer to the nearest million people.

<p>A 99,000,000 telecommuters</p>	<p>Incorrect. The correct exponential function $y = 4.36(1 + .169)^x$ was used; however, '20' was substituted for x instead of 30. Remember x represents the number of years that have lapsed since 1990.</p>																
<p>B 472,000,000 telecommuters</p>	<p>Correct. The exponential function that models the given data is $y = 4.36(1 + .169)^x$. In order to predict the number of telecommuters in 2020, one should let $x=30$ since 30 years will have lapsed from 1990 to 2020.</p> <p>Using the table, after 30 years, the number of telecommuters would be around 472 million.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <table border="1" style="font-size: small; text-align: center;"> <thead> <tr><th>X</th><th>Y1</th></tr> </thead> <tbody> <tr><td>30</td><td>472.43</td></tr> <tr><td>31</td><td>552.28</td></tr> <tr><td>32</td><td>645.63</td></tr> <tr><td>33</td><td>754.76</td></tr> <tr><td>34</td><td>882.33</td></tr> <tr><td>35</td><td>1031.5</td></tr> <tr><td>36</td><td>1205.8</td></tr> </tbody> </table> <div style="border: 1px solid black; padding: 5px; font-size: small;"> <p>Y1(30) 472.4270686</p> </div> </div>	X	Y1	30	472.43	31	552.28	32	645.63	33	754.76	34	882.33	35	1031.5	36	1205.8
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<p>C 83,000,000 telecommuters</p>	<p>Incorrect. The quadratic model $y = .219x^2 - .479x + 5.60$ was used to model the data and '20' was used for x instead of 30. The growth was exponential so the quadratic model is incorrect.</p>																
<p>D 188,000,000 telecommuters</p>	<p>Incorrect. The quadratic model $y = .219x^2 - .479x + 5.60$ was used to model the data, the was exponential so the quadratic model is incorrect.</p>																